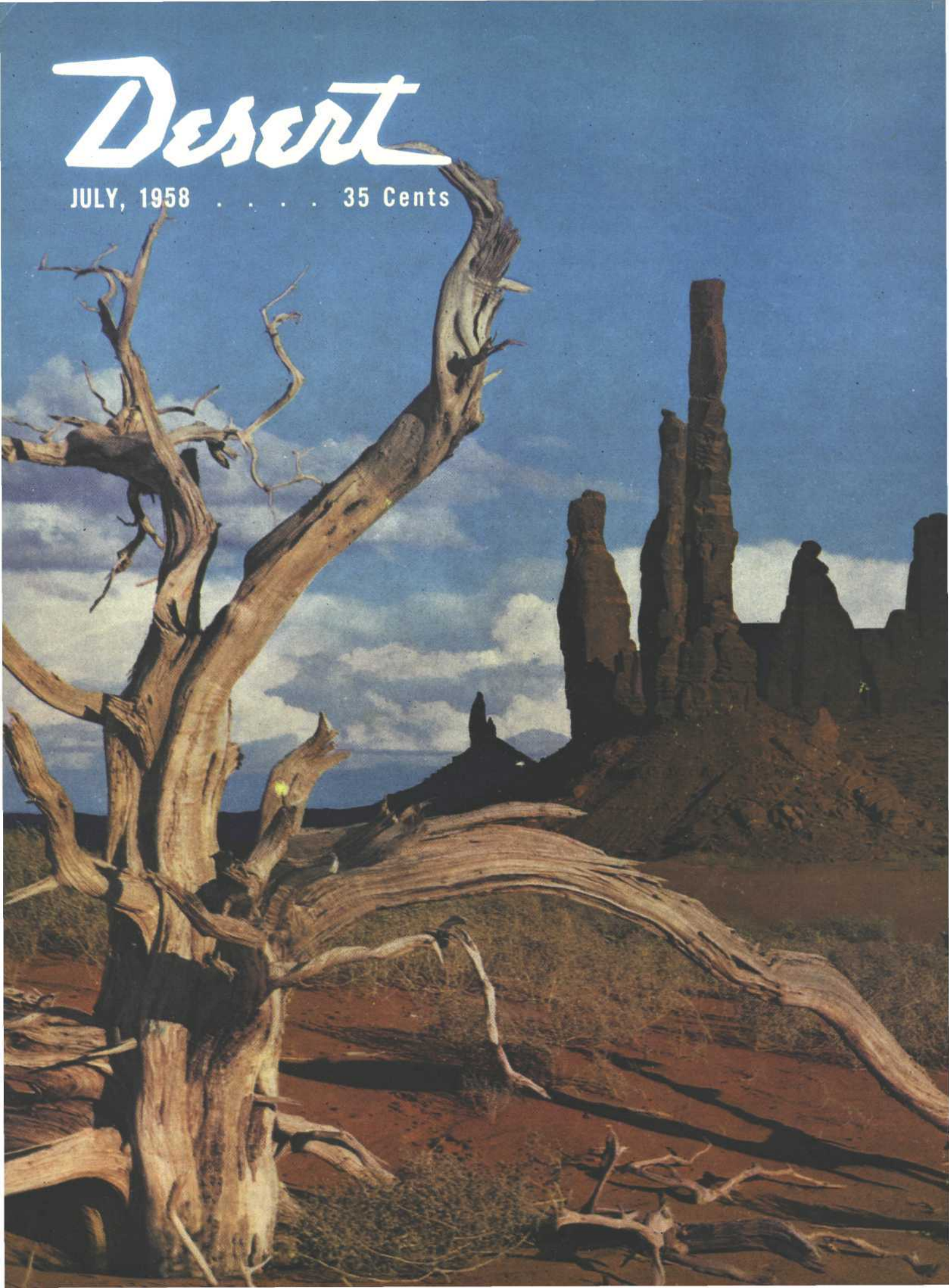
Desert

JULY, 1958 . . . . 35 Cents



National Park Service Photo

ROSE-SWEET DESERT WIND

By Tex Reese
Perris, California

A red, red rose has served for me
To tame the sand-waves tossing high,
The boisterous wind, the laughing throng
Where sage the chipmunks sport among,
Gay cactus and the song-birds free
All share this freedom found of me
Beneath the desert's golden sky.

Each passer-by my rose may see,
From golden dawn to fall of eve;
May pause and read, in fragrant clime,
My paraphrasing some quaint rhyme
And watch the wild life romp in glee,
Or share a happy hour with me,
Mayhap a crimson flower retrieve.

In silence or when winds are high,
By starry night or dewy dawn
This red rose planted here by me
Wafts love-like fragrance rich and free
To charm and cheer each passer-by.
Like ocean-tides when waves are high,
My rose-sweet Desert Winds roll on!

• • •

THE OLD GHOST TOWN

By Mrs. Gladys Thomas
Fallon, Nevada

Like a little old lady, is the old ghost town,
Dozing and dreaming, in the fierce summer heat;
Remembering the days when she was young,
And had thousands of men at her feet.
She had never had beauty, she regretfully sighs,
But her wealth made her queen for a while.
Men had hurried to her from all over the world,
And battled, and fought for her smile.

For some she had smiled, and poured out her gold,
Giving life promise and zest;
Others she'd spurned, bringing death and despair,
This wild, lusty queen of the west.
Now she is old, and forsaken by all,
Her treasure long since spent;
But, clasped in the arms of the encircling hills,
With her memories, and dreams, she's content.

HIDDEN MAGIC

By Anona McConaghy
Bellflower, California

The desert hides her beauties
From the casual eye,
Small creatures are nocturnal,
Desert birds are shy.
The desert hides her treasures
From eager eyes of men,
Rich veins of gold and silver
Found, and lost again.
The desert hides her magic
With blends of beige and gray.
How often he who lingers
Gives his heart away.

• • •

A KING DEPARTS

By Ethlyne Folsom Springer
La Mesa, California

As for proud conquistador
Traveling on the Royal Way,
Pomp and splendor mark the passing
Of a Western desert day.
Circling pine and ancient cedar
Swing their censers, so that he
May depart in perfumed glory,
While stars chant the Rosary.
Desert winds in muted voices,
Tell of all that was and is;
Hills, like Cardinals in crimson,
Watch above the obsequies.

Faith

By Tanya South

How deep then is your Faith? Do you not know
That every blessed thing that you bestow
Must in full measure all return to you?
And if you give but love, love will pursue
Your days and all your ways, and will unlock
All doors, all barriers that ever block.

The Saguaro Army

By Mrs. Pauline Henson
Ft. Huachuca, Arizona

Legion on legion,
Encamped upon the sands,
Each soldier a Goliath,
The Saguaro Army stands
Armed and at attention,
Silent and still,
Yet marching through the desert,
Guarding on the hill.
Sentries by the roadside,
Battalions on the plain
Endure the sun and wind and dust,
Defy the lack of rain.
Commandoes slip through canyon,
Scouts climb upon the trail;
Two giants hold the mountain pass
And know they must not fail.
Spirits of Armageddon
Nature has consigned
To stand the desert's burning watch
Until the end of time!

• • •

WALK SOFTLY WHEN THE YUCCAS BLOOM

By Mildred Breedlove
Las Vegas, Nevada

Walk softly when the yuccas bloom—
Assume a gentle air.
For desert life is harsh and stern,
And spring may not again return
To yuccas and agaves there
For many years.
Salt cedar plumes may come and go,
And cacti stage a brilliant show,
But yucca spears
Do not, two springtimes in a row,
Give way to such magnificence!
So walk with reverence
When moisture comes to desert sand
And yucca buds begin to swell,
For angels must be close at hand
To guard each bursting bell.

• • •

SILVER PEACE

By Constance Walker
Los Angeles, California

Walk in the desert,
Solitude has much to share,
You will feel congenial warmth
In the balm of crystal air.

Walk in the sunlight,
Yearning eyes are sure to trace
In a glass of ether-blue,
A familiar mirrored face.

Walk in the silence
And a loving voice will come
From the whispering of sage
In the wind's persistent hum.

Walk in the desert
For your heart will be aware
On a lustered path of moonlight,
Silver-peace is waiting there.

• • •

HIGH DESERT

By Elizabeth L. Sargent
Ontario, California

There's a cabin on a hillside
Where the desert calls to me,
And the nights are long and peaceful
And my heart from care is free.
There, the chaparral comes creeping
Silver gray, up to the door,
And the night winds whisper music
No one ever heard before.
I can close my eyes and listen,
Lost in wonder and delight,
Drifting off to dreamless slumber
Until morning brings new light.

DESERT CALENDAR

July 3-4 — Gunnison Valley Days, Gunnison, Utah.
July 3-4 — Mounted Patrol Rodeo, Fort Sumner, New Mexico.
July 3-5—Bit & Spur Rodeo, Tooele, Utah.
July 3-6—Annual Fiesta and Mountain Spirits Dance, Mescalero Apache Agency, New Mexico.
July 3-6—Cowhands Rodeo, Cloudcroft, New Mexico.
July 3-6—25th Annual Hopi Craftsman Exhibit, Museum of Northern Arizona, Flagstaff.
July 4—Independence Day Celebrations in most Southwestern communities.
July 4 and 24 — Ute Indian Sun Dance, Roosevelt, Utah.
July 4-5—71st Annual Frontier Days Rodeo, Prescott, Arizona.
July 4-6—2nd Annual Antelope Valley Rodeo and Roundup. Parade on 4th. Palmdale, California.
July 4-6—Sierra Club's Desert Peaks Section hike to Wheeler Peak, near Lehman Caves National Monument, Nevada.
July 4-6 — Rodeo and Silver Spurs Award Presentation, Reno.
July 4-6—30th Annual Southwest All-Indian Pow Wow, Flagstaff.
July 10-12 — Ute Stampede, Nephi, Utah.
July 10-13—Rodeo, Santa Fe.
July 12—Fourth Annual Sun Worshipers Fiesta, Borrego Springs, California.
July 12-14—All Faces West Pageant, Ogden, Utah.
July 14—Corn Dance, Cochiti Pueblo, New Mexico.
July 17-19—Dinosaur Roundup Rodeo, Vernal, Utah.
July 18-19—Mt. Timpanogos Hike, American Fork, Utah.
July 18-19 — Square Dance Festival, Show Low, Arizona.
July 18-19, 21-24—Days of '47 Rodeo. Parades on 18th and 24th. Salt Lake City.
July 19, 21, 23-24 — Pioneer Days Celebration and Rodeo, Ogden, Utah.
July 23-24—San Juan County Fair, Monticello, Utah.
July 23-24—Pioneer Days Celebrations: Snowflake Rodeo, St. Johns Rodeo, and Safford, Arizona; Bountiful Handcart Days, Orem Utah Valley Days, Roosevelt Rodeo, Springville, Cedar Fort, Ephraim, Milford, Lehi, Fountain Green, Hyrum, Marysvale and Meadow, Utah.
July 26 — Corn Dance and Fiesta, Taos and Santa Ana pueblos, N.M.
July 26-27—County Fair, Los Alamos, New Mexico.
July 27 — Sheriff's Posse Roundup, Flagstaff.
July 27-August 3—Navajo Craftsman Exhibit, Museum of Northern Arizona, Flagstaff.
July 28-29—Blue Mountain Rodeo, Monticello, Utah.
July 29-August 7 — 1958 National Soaring (glider) Championships, Bishop, California.
July 31-August 2 — Harvest Days, Midvale, Utah.
July 31-August 3 — Eastern Sierra Tri-County Fair, Bishop, California.

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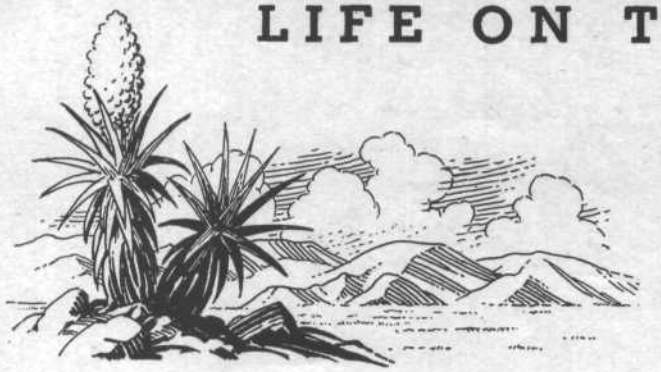
LIFE ON THE DESERT



Where We Found Happiness . . .

The desert was so new, so vast—so magnificent. From the first moment they laid eyes on the startling Indian Wells Valley and its bordering mountain ranges, the Fenleys knew that this was their promised land. Here they grew to love every phase of desert living, and here they found peace and contentment.

By SAVOLA FENLEY

IN OCTOBER, 1943, a message came from my husband's brother who was on the Mojave Desert. He urged my husband to make no delay in coming out to stake a claim adjacent to those on which he had found "rich tungsten and gold indications." Tungsten then was a very important war mineral and "we all might become rich." It sounded good, so we made the trip.

This very first visit to the desert was the beginning of life for us. The tungsten and gold on our claim did not pan out too well, which was a deep disappointment to my husband, but we soon learned that finding gold in the truest sense is to find it within one's self.

During the early war years the Navy had established a base near our claims at Inyokern, and since we could not make a living at mining, I suggested to my husband that he get a job at the base. Prospecting could be a sideline

So he returned to the desert. I remained at our home on the coast until I could join him, for there was no available housing at Inyokern.

My husband made plans to build a home on a site overlooking the vast Indian Wells Valley. To this day, when visitors arrive for the first time, there are always exclamations over the magnificent view from our home—the panorama of the valley below, the towering Sierras and Mount Whitney's snow-clad peak, the arid El Pasos, and the massive ranges guarding Death Valley.

Our home is remote, being two miles from the highway and eight miles from the base. Over the years we have hauled every precious drop of water for domestic use and for the birds, rabbits, chipmunks and the many other little animals which steal in at night. These denizens we have loved as we have loved everything about this desert. Even the wind, so annoying to most, has been like a therapy to us—soothing as it sings in the greasewood which only those attunded to things of the desert can hear.

Recently, a young woman visitor who has been at the base since 1944, remarked that she had lost her former awareness of the wind, but the memory of the desert in those early days is always with her.

In a way, we were pioneers. When we moved here all that one could see on the floor of the desert was the hog ranch, a dairy, and the few houses occupied by old-timers. A gas station, grocery store and postoffice made up the business district. Now people coming to visit me at night see a myriad of lights below from the city that has nearly every modern convenience and facility.

The best of life has been lived in this small home. I doubt if it would have been the same had we settled in the boom town adjoining the base. We still would have gone out on those wonderful treasure hunts for gem stones, pretty rocks and old bottles turned to roval purple by the sun's rays. We still would have gone down the many roads we traveled, looking for old camps or merely browsing along on tranquil days! The rain would have been the same—the marvelous rain which permeates the air with that heavenly pungent aroma of creosote. But, our isolated home gave us even more.

Today I had very special visitors, and in my guest book they wrote: "A highlight in our lives, a great privilege, and today we have found in this home what all the world is seeking—peace and contentment."

And so, where in all the world could my husband have left me to better begin the reconstruction of my life—the life of which 33 years were spent with him — than here in this little house which serves as study, studio and living room, every window looking out to my everlasting and everchanging hills and mountains!

He passed away in February, 1957. As I write, the sun set only minutes ago. In the east hangs the pale moon surrounded by the still rose colored clouds of the sunset. It is all mauve and rose toward our old Red Mountain, too.

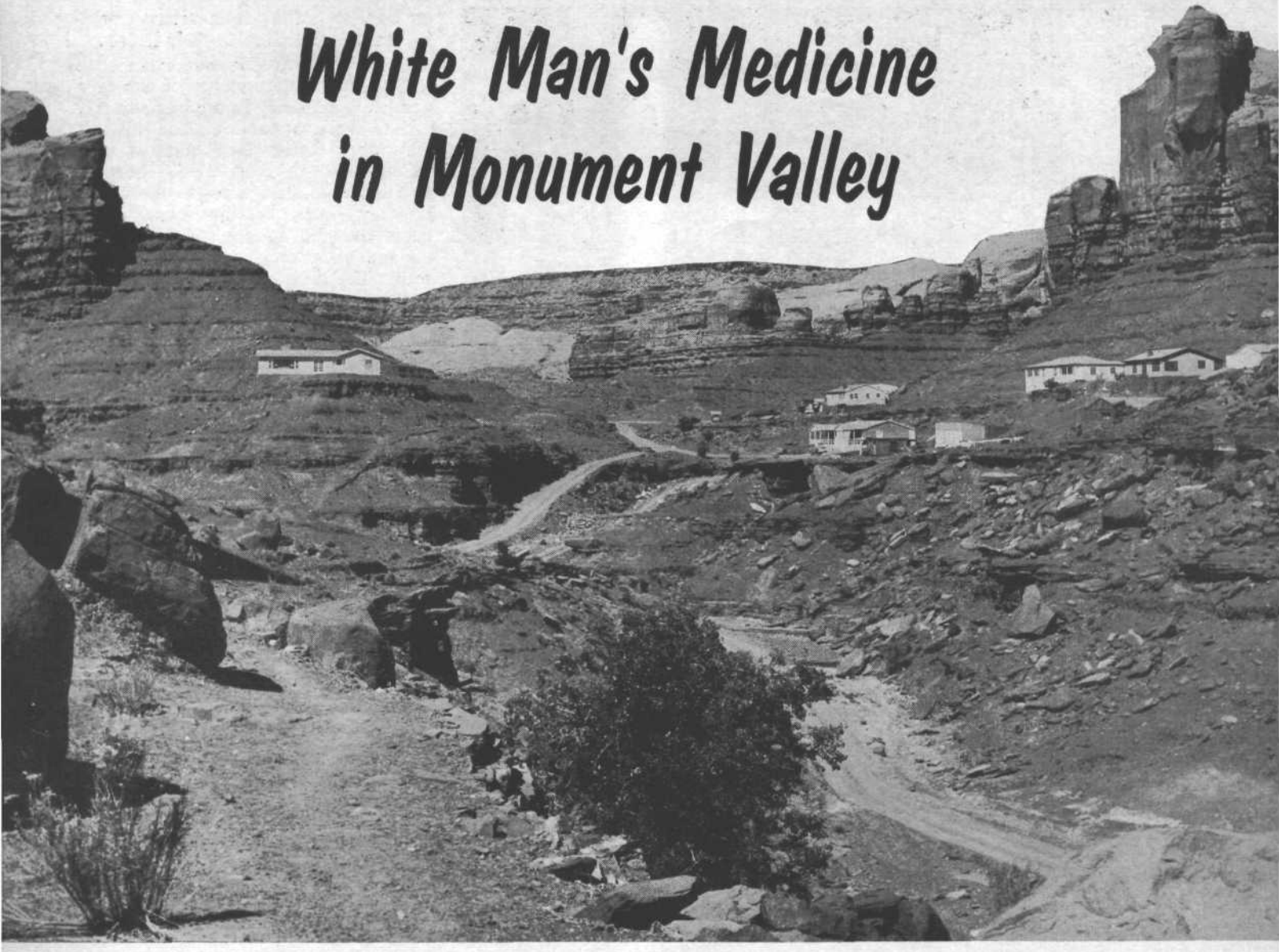
The air has the chill of winter, birds are on the wing, flitting happily by in this moment before dusk, going wherever birds go for the night.

Fading now are the colors of the magnificent desert sunset. But, as I look toward the El Pasos, there, brushed out across the southern horizon, are even more beautiful rose and gray clouds in this last moment before twilight.

A DIPLOMATIC MESSAGE STRAIGHT TO THE POINT

August 3, 1853. . . . The excitement occasioned by the threats of Walkara, the Utah chief, continued to increase during the day we spent at Parawan (Utah). Families flocked in from . . . small settlements and farms, bringing with them their movables, and their flocks and herds. Parties of mounted men . . . patrolled the country . . . During our stay, Walkara sent a polite message to Colonel G. A. Smith, who had military command of the district . . . telling him that "the Mormons were fools for abandoning their houses and towns, for he (Walkara) did not intend to molest them there, as it was his intention to confine his depredations to their cattle, and that he advised them to return and mind their crops, for, if they neglected them, they would starve, and be obliged to leave the country, which was not what he desired, for then there would be no cattle for him to take."—Gwinn Harris Heap's *Central Route to the Pacific,* Journal of E. F. Beale, published in 1854.

White Man's Medicine in Monument Valley



Buildings of the Monument Valley Mission Hospital and living quarters for staff members are situated in a deep and scenic canyon a short distance west of the Goulding Trading Post.

New hope for a better way of life has come to the scattered Navajo and white residents of the vast 10,000-square-mile Monument Valley. It stems from the Mission Hospital operated there for the past few years by a handful of dedicated medical missionaries working under the auspices of the Seventh-day Adventist Church.

By NELL MURBARGER
Photographs by the author

HOLDING THE ragged canvas covering aside, we passed single file through the low door of the hogan. As the warm bright glare of the desert morning gave way to the gloomy half-dark of the dwelling's interior, it was a moment before I could see the three persons in that room.

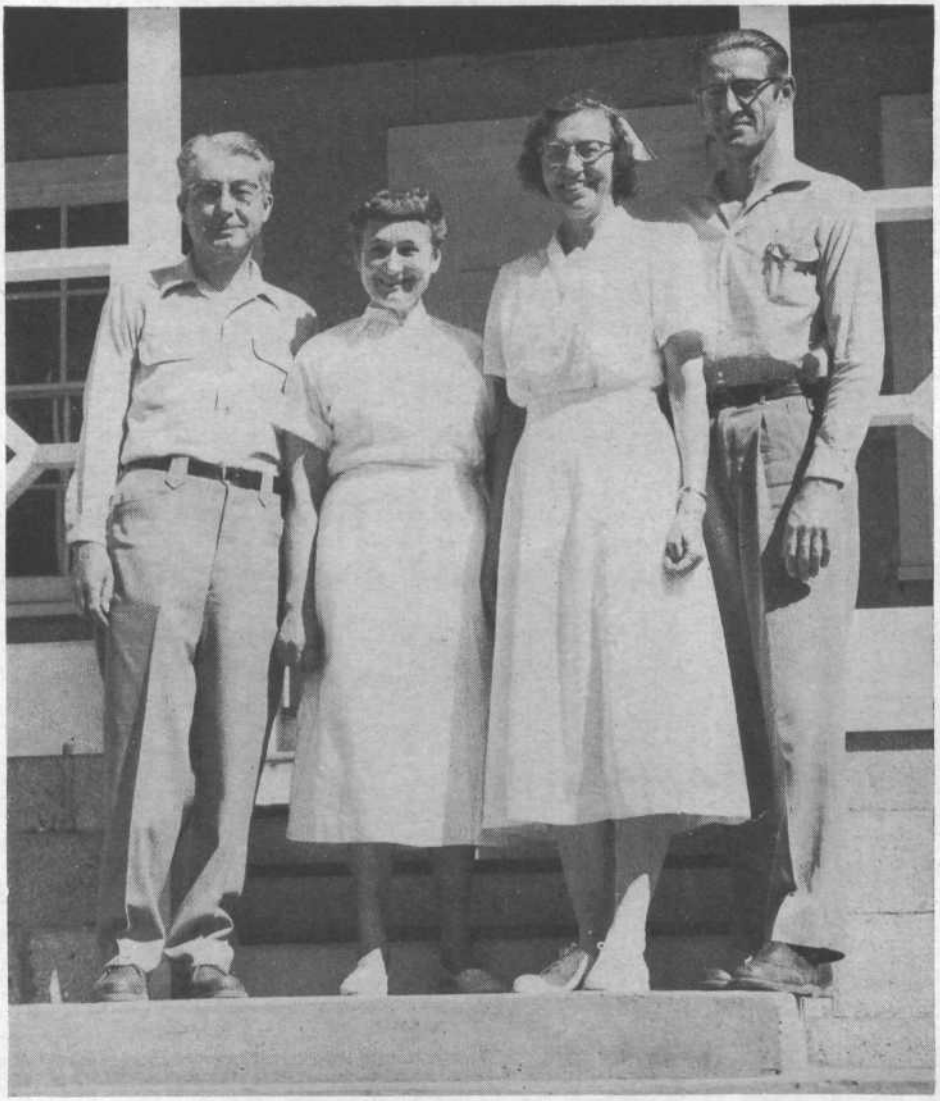
On a worn sheep pelt spread upon the red-sand floor, sat a young Navajo woman, her arms cradling a baby; across the hogan, closer to the smoldering juniper-wood fire, squatted the old medicine man, Gray Whiskers, whom we had come to see.

That he had been a handsome man was obvious; but now his saddle-brown face was etched with the wisdom and weariness of more than 80 years. Across his upper lip lay a mustache as thin and gray as the straggling hair bound back by the black cotton headband; he was clad in an odd-assortment of cast-off garments. The old eyes, however, still mirrored a strange keenness, and the thin hand extended to us in greeting was firm and steady.

Speaking in his native tongue, the patriarch fell easily into conversation with my companions, Maurice Knee, who has spent most of his life amongst the Navajos, and Marvin and Gwen Walter, who have been ministering to the tribe for over 15 years.

Examining Gray Whiskers' bandaged foot, which he had broken several weeks earlier, Gwen explained to the old man that the bones had healed well, but that he must stimulate circulation by massaging the foot and alternately soaking it in hot and cold water; also, that he should gradually resume walking without the aid of his crutches.

Then Gwen switched her attention to the sickly baby girl in the arms of the young mother, one of Gray Whis-



On the hospital steps, from left, Dr. J. Lloyd Mason and his wife, Alice; Gwen Walter and her husband Marvin, Mission Hospital director.

kers' several daughters. Suspecting that the infant needed some food element lacking in her mother's milk, Gwen gave the young woman a bottle of vitamins and explained their use. A pair of laughing tousle-haired grandsons of the old man came racing across the dunes from their nearby tent home. They had no ailment so serious that a handful of red and yellow lollipops, which Maurice produced from a box in the jeep, could not cure.

With Gray Whiskers and his progeny clustered about the door of the hogan waving farewell, we again climbed into our jeep and started off down the rutted sandy trail toward the next isolated family on Gwen's roster of Navajo out-patients.

Not until after sunset—seven hours and numerous calls later—did we return to the hospital, tired, hungry and wind-burned, but with the good feeling that comes from doing a worthwhile task.

This was my introduction to the wonderful program of the Monument Valley Mission Hospital, a Seventh-day Adventist institution administered locally by the Rev. Marvin Walter, director, and his wife, Gwen, a registered nurse, and ably assisted by Dr. J. Lloyd Mason, resident physician, and his wife, Alice, also a nurse. Upon these four good-natured hard-working persons, some 4000 others—both Indians and whites—are dependent for their around-the-clock medical assistance. The fact that these potential patients are thinly scattered over 10,000 square miles of desert, is but one of the unique features of operating a clinic in Monument Valley on the Arizona-Utah border, 175 miles from the nearest railroad.

As Maurice Knee skilfully piloted the jeep through treacherous blow sand, up and over dunes, and around and among the great sandstone monoliths which give Monument Valley its name, I had the opportunity that day to learn from Marvin and Gwen Walter the story of this humanitarian project which is so close to their hearts.

Before the Mission was established eight years ago, residents of the area who were seriously injured or severely ill had three possible alternatives: If they were whites they bumped over the then rough road to the hospital at Monticello, 100 miles to the north. If they were Navajos they were taken over an equally rough road to the Indian hospital at Tuba City, Arizona. The third alternative was to call in the medicine man. Although trained in the ritualistic sings and sand paintings, and familiar with the curative properties of native herbs, these native practitioners know virtually nothing of surgery, antibiotics, or other modern life-saving processes.

Realizing the urgent need for better medical facilities in Monument Valley, Harry Goulding and his wife "Mike," veteran traders in Monument Valley (*Desert Magazine,* August, '57), had tried for years to interest one of the church organizations in establishing a medical mission in the Valley. They offered their moral support plus a renewable 99-year lease on 10 acres of land with water available.

It was the Seventh-day Adventist Church which accepted the challenge, and in September, 1950, established Monument Valley's first hospital. Its headquarters was a small house trailer located at the base of a towering red-sandstone cliff a short distance from Goulding's, and its staff consisted of one registered nurse—Gwen Walter—tall, slender, soft-spoken, 41 years of age, and the mother of two boys and a girl.

"When we began our work, there were only 600 persons, six pickup trucks, and not one paved road in all the 10,000 square miles we were to serve," recalled Gwen. "Today, due to uranium and other developments, the population is probably close to 5000.

"Last year we gave medical care to over 3000 persons. Since our hospital is the only established medical facility in the 200 miles between Tuba City and Monticello, many of these patients came to us from points as far as 50 miles away.

"For several years the Presbyterian Mission at Kayenta, 25 miles to the south, had a registered nurse, and visiting doctors came periodically from the splendid hospital at Ganado to help serve the medical needs of that area. Today, however, the regular nurse is gone and the Public Health nurse does what she can for the community."

As we went from hogan to hogan that day it was obvious that the Wal-

Vivian Christensen, standing, and some of her pupils in the Mission school.

ters are held in deep respect and affection by everyone in Monument Valley, Indians and whites alike.

That evening the Masons invited the Walters and I to visit their comfortable cottage on the canyonside above the hospital, and there I learned more about the fine work these medical missionaries are doing at this remote desert outpost.

Knowing the reluctance of some of the tribesmen to accept missionary teachers and modern practices, I asked Gwen if they had encountered much opposition to their work. She answered "no."

"Even when we first came to Monument Valley," she said, "the people came to us readily—only the medicine men were reluctant to accept us. After Harry Goulding explained to them that their medicine was good, and our medicine was good, too, and that combined they made a really powerful medicine, they began calling me—but not until after they had conducted their sing. We told them that if they would call me sooner, the patient would not become so ill; and before too long, they began calling me at the same time they came in to get materials for their sing.

"Old Gray Whiskers was the last medicine man to accept us, but even he gradually lost his prejudice, and now permits us to administer our medication at the same time his ritualistic ceremony is in progress.

"Harry tells us that nowadays he sells very little material for sings—that the people come to get us instead."

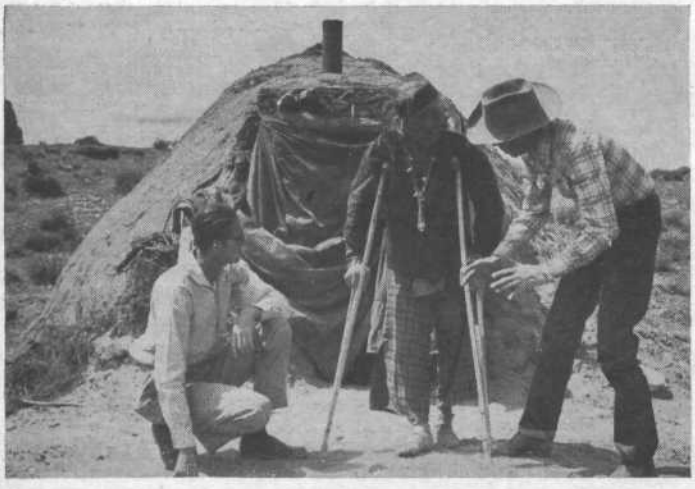
The ministrations of the medicine men are not confined to superstition. According to Gwen some of the older medicine men have great knowledge concerning the use of native herbs.

"They have one potion for halting tooth decay—and it really seems to do the job!" she said. "They also compound a snake-bite medicine that is very effective; and they have some native herb to stop vomiting which is better than anything I know!"

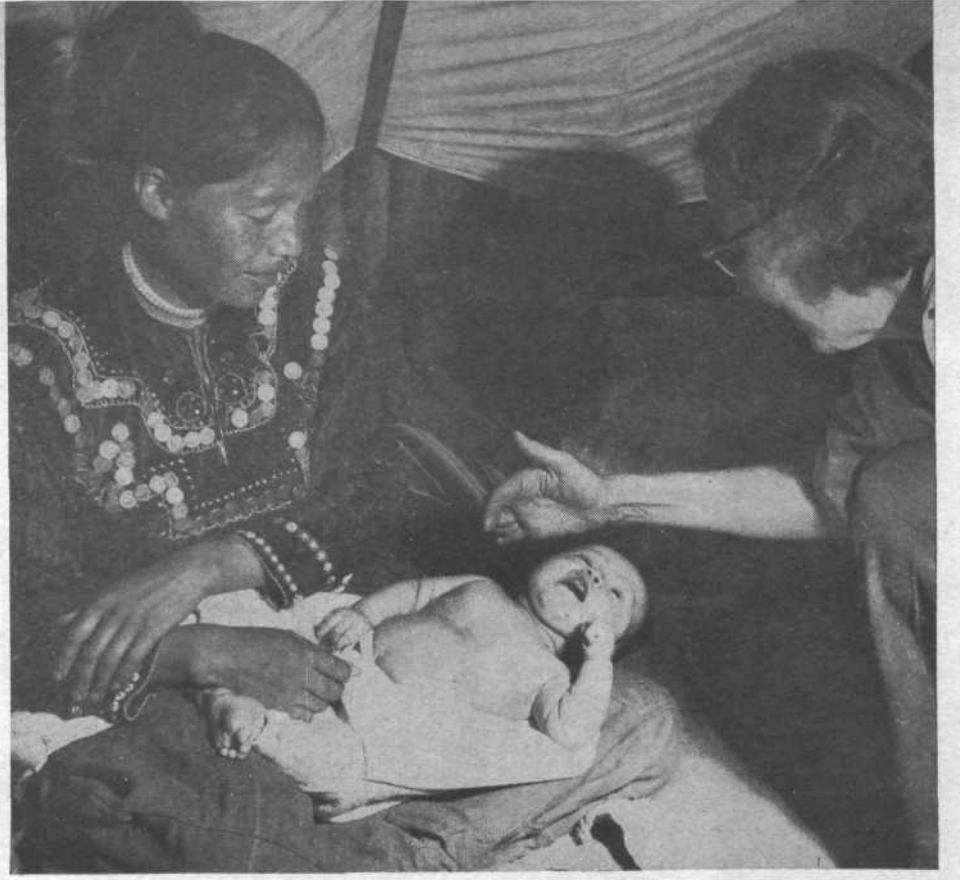
This live-and-let-live attitude and willingness to accept the other man's beliefs at face value, is partially responsible for the high regard in which the Monument Valley Mission Hospital is held by everyone familiar with its work.

Actually the institution is a hospital in name only. Down the canyonside a short distance from the present building, is the foundation and partially-erected walls of what eventually will be the hospital. Due to lack of funds,

Marvin Walter, kneeling, and Maurice Knee explain proper course of treatment for his injured foot to medicine man Gray Whiskers.



Gwen Walter discusses health problems with two Navajo travelers while her husband Marvin, left, and Maurice Knee look on.



Nurse Gwen Walter plays with a happy Navajo baby while his mother looks on. White cloth in background is a bedsheet canopy fastened to the hogan's ceiling so sand will not fall into the baby's eyes.

all work on the building is now at a standstill. Since present facilities do not meet requirements set for Indian reservation hospitals, the operation is licensed only as a clinic, and as such, can hold a patient for a maximum of 24 hours, after which the ill or injured person must be transferred either to the Monticello or Tuba City hospital.

"In obstetrical cases, we are permitted to keep the mother and child until we feel they can return home in safety," said Gwen. "In some instances, this is less than 24 hours, but rarely over 30."

After traveling the 100 miles of badly corrugated road between Tuba City and Monument Valley, it seemed to me that a person ill enough to require hospitalization would be seriously endangered by a ride over that wracking course. Marvin agreed.

"It would be a terribly hazardous trip, but we have a Good Samaritan—Tommy Fraka—who has given us incalculable aid. Tommy is a mining contractor who has worked at various uranium mines in the vicinity. He flies his own plane, which he keeps at Goulding's airport. In the past two years he has provided air-ambulance service for dozens of critical cases—sometimes making as many as three round-trips to Tuba City in a single week. He cheerfully donates his time and expenses, and many lives have been saved as a result of his efforts. Other contributors have been extremely open-hearted, too," said Gwen.

In addition to operational funds budgeted by the Seventh-day Adventists, the hospital receives much help from persons outside the church—one of its important income sources being voluntary donations made by guests of the Gouldings, who see the work being done and have been generous in their contributions.

Besides medical assistance, the hospital crew also distributes used clothing to needy families—one room at the clinic is maintained as a clothing supply depot where contributed garments are sorted for type and size and stored away on clean dry shelves. Established sources provide all the used clothing they can absorb, and readers who have garments they wish to contribute to the Navajos should send them to other recognized agencies where the need may be greater.

Watching the neighborly manner in which Marvin and Gwen Walter dealt with their Indian clients the next day, exhibiting neither drippy sentimentality nor the impersonal coldness of a filing-card system, it was evident that they are ideally suited for this exacting work. Their home originally was at St. Helena, California, and their first mission work was with the Maricopa Indians near Phoenix. In November, 1941, they were transferred to Holbrook, Arizona, and began working in the southern and western portions of the Navajo Reservation, remaining there until they were able to obtain living quarters at Bitahochee, an Indian trading post 40 miles to the north.

Any young wife and mother not completely dedicated to a missionary's life might have found cause to complain, for their living quarters at Bitahochee consisted of an abandoned Navajo hogan, 16 feet across at floor level. In this single room the Walters and their three children resided for 22 months—during which time Marvin was obliged to jack-knife his six-foot-three-inch frame through a front door that measured only 48 inches from sill to top!

In 1945 the Walters returned to Holbrook and secured land for the erection of a boarding school, which they helped to build and operate. Today the Holbrook Mission School has more than 100 boarding Navajo and Hopi students, and is teaching up to the 10th grade.

Moving to their present post in September, 1950, the Walters established their home in a small house trailer and carried on their clinical activities from a second trailer. For the first six and a half years, the Mission Hospital's entire medical program was the sole responsibility of Gwen Walter, the first resident physician not being assigned there until the spring of 1957. After four months, this physician was obliged to resign due to illness, and again Gwen took over on a round-the-clock basis. In February of this year, the hospital staff was materially augmented by the arrival of Dr. and Mrs. Mason, who came to the mission from Bishop, California, where he had been engaged in private practice.

The Monument Valley Mission Hospital has charged no fees for medical, surgical, or nursing services rendered to the Navajos, or for medicine provided.

"As a missionary nurse, I did not charge for my services. I did accept their free-will offerings, and some expressed their appreciation in that manner. However, now that we have a doctor, we will be making charges based on ability to pay. The Navajos pay their medicine men very well, and we feel that those able to do so will be equally willing to pay us," Gwen said.

The mission staff includes Miss Vivian Christensen, a graduate of Pacific Union College, who teaches all grades and all subjects at the day school. Vivian appears but little older than some of her pupils. Before coming to Monument Valley she taught for two terms at an Adventist school in Africa, where her parents are engaged in missionary activities.

Prior to establishing the present institution five years ago, there had never been a school in Monument Valley.

Starting in a small way, it has grown steadily to an enrollment of 20 students, including six white children and 14 Navajos. As bus service is not available, even little first and second-graders walk as much as two miles to school in the morning, and two miles home at night.

"They're strictly on their own," said Marvin. "No one forces them to attend school. If they don't want to come, they don't have to—but most of them want to."

The mission school provides a standardized curriculum, plus Bible study.

"In order to meet all requirements for our world program, we set high scholastic standards," explained Marvin. "We meet all local standards—plus."

That the Monument Valley school is well regarded is evidenced by the fact that the county superintendent of schools recently cited it as the best-equipped one-room school in San Juan County.

In addition to its program in Monument Valley, the hospital staff conducts clinical work two afternoons each week at the small town of Mexican Hat, 25 miles to the north, where one of the largest uranium mills in the West is located.

"I should think all this would keep you busy about 26 hours each day," I said.

Gwen laughed. "It does. But it's a lot of satisfaction and fun. We get many laughs out of our work," she went on. "Especially from some of the notes that are delivered to us.

"One day a medicine man sent a note saying he wanted me to come to his camp to 'give shots for the spring fevers.' One girl sent a message asking me to come to her hogan and help her. 'My sister,' she wrote, 'is going to have a baby tonight, or every night.' Another woman wrote: 'Please come to our camp. I guess you can sew his head up. Sonny cut it yesterday'."

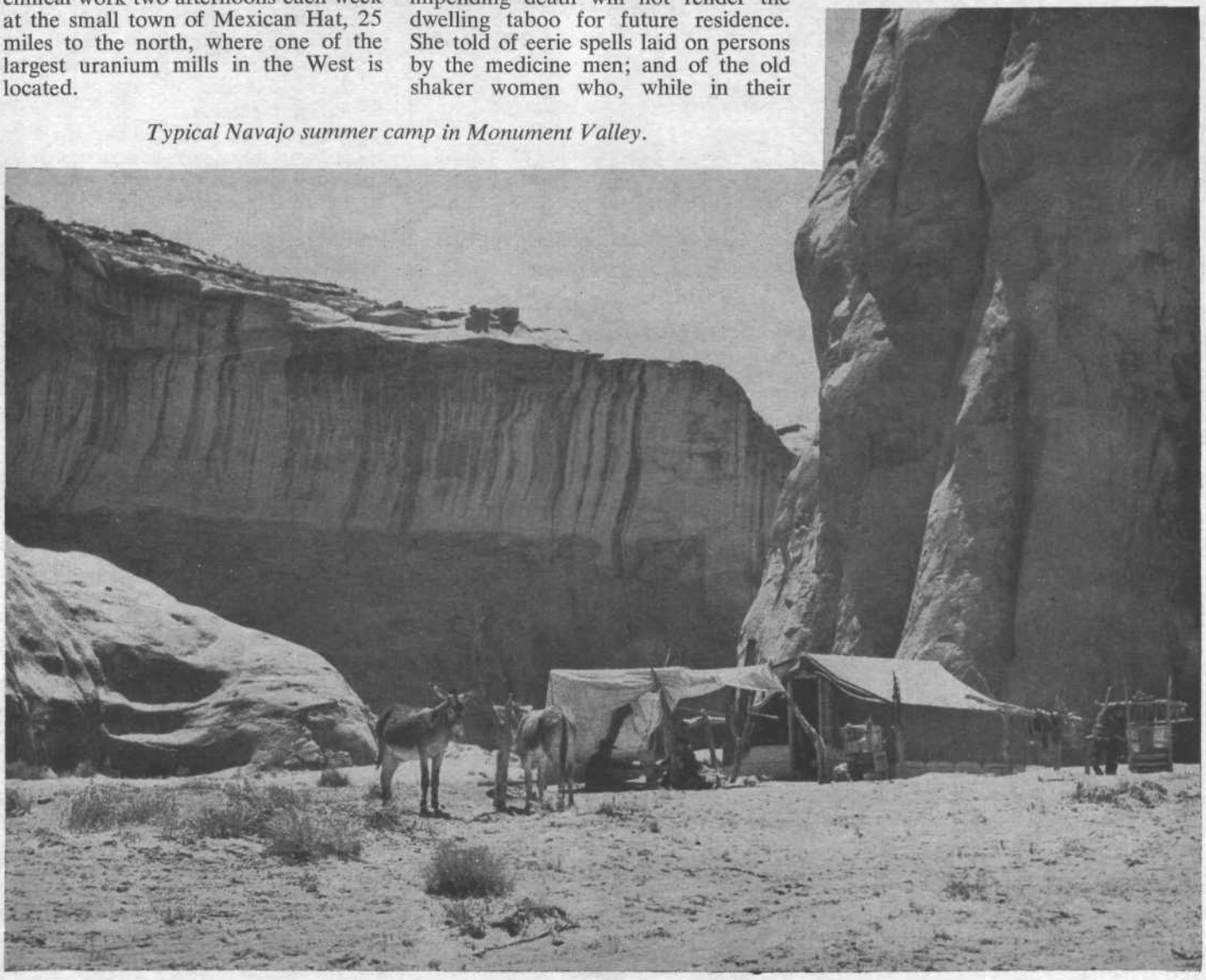
"Did you sew it up?" I asked.

Gwen nodded. "We sewed it up."

Speaking in her soft pleasant voice, Gwen told of Navajo babies she had helped bring into the world, and of aged tribesmen whom she and Marvin had buried. She told of the seemingly cruel Navajo custom of banishing from the hogan the hopelessly ill so the impending death will not render the dwelling taboo for future residence. She told of eerie spells laid on persons by the medicine men; and of the old shaker women who, while in their trances, are capable of performing physical feats far beyond their ordinary strength.

It all added up to a strange and remarkable culture, and made me realize that in my incidental visits to the Navajo country I had seen only the bare surface of that culture.

In our field trip over Monument Valley that day, I had seen how the Navajos live, with large families—including grandparents, mothers, fathers, children and in-laws—all crowded into a single hogan no larger than an average-size bedroom. I had seen smoky open cook-fires blazing in the center of these hogans, and quarters of darkening mutton hung to dry on cords stretched across the interior from wall to wall. Seeing these things I had wondered how it would seem to live all one's life with only the loose red sand for a floor, with no windows to admit the fresh air and sunlight, and without a single stick of furniture, or any visible source of water; without any sanitation facilities, or any opportunity to



Typical Navajo summer camp in Monument Valley.

plant and grow a garden. Gardens don't thrive in a restless land where the sand that is here today may be gone with the wind tomorrow.

Not being a Navajo it is impossible, of course, for me to think as a Navajo does; therefore, I have no means of knowing how these people feel about the way in which they live. It seems logical to suppose that some of them abhor the way of life that environment and custom have forced upon them. Others probably accept that life passively and resignedly; and I don't doubt that there are many older Navajos who prefer their mode of living and would be quite unhappy and miserable if they were made to live as we do.

These are matters I simply can't know; but of one thing I feel certain. From the expressions I saw on Navajo faces in those drab hogans and in the clinic on this visit, I am confident that the native Americans of Monument Valley feel real trust, loyalty and affection for Gwen and Marvin Walter, and are thankful to have them as friends.

It is only logical that they should feel so, for good neighbors are popular with people in every land—and that's the kind of neighbors the Walters and Masons are.

Desert Quiz

Desert Quiz is published both for those who are already well acquainted with the desert Southwest and for those who would like to improve their knowledge of this fascinating region. The questions include geography, history, botany, mineralogy, Indians and the general lore of the desert country. Regular readers of *Desert* find their scores improving from month to month as the answers to the questions appear sooner or later in these pages. Twelve to 15 is a fair score, 16 to 18 is excellent, over 18 is super. The answers are on page 32.

1—Asbestos is—Mined from the ground_____. Fabricated from cotton_____. Grown on bushes_____. Made from coal tar_____.

2—The Mountain men who trapped the western country in the middle of the last century derived their income mostly from—Fox furs_____. Mink_____. Beaver_____. Coon_____.

3—Breyfogle is a name often mentioned in the Southwest in connection with—An unscaled mountain peak_____. Volcanic crater_____. Ghost town_____. Lost mine_____.

4—One of the following plants might be mistaken for Nolina—Catsclaw_____. Yucca_____. Indigo bush_____. Creosote_____.

5—Albuquerque, New Mexico, is on the bank of the — San Juan River_____. Colorado_____. Rio Grande_____. Pecos_____.

6—If you traveled west on the Southern Pacific you would cross the Colorado River at — Yuma_____. Needles_____. Parker_____. Blythe_____.

7—The Southwestern state having the smallest population per square mile is—Arizona_____. Utah_____. Nevada_____. New Mexico_____.

8—Early American Indians ground their meal in an—Arrastre_____. Mortar or metate_____. Mescal pit_____. Atlatl_____.

9—The approximate age of prehistoric pueblos is determined by—Tree rings in the roof timbers_____. Indian legends_____. Nearby petroglyphs on the rocks_____. Pottery shards_____.

10—The most conspicuous coloring in the fossil wood found in the Petrified Forest National Monument is — White_____. Green_____. Red_____. Orange_____.

11—If you were entering Death Valley from Beatty, Nevada, you would go through — El Cajon pass_____. Raton pass_____. Emigrant pass_____. Daylight pass_____.

12—The mineral-in-solution which forms travertine is — Quartz_____. Calcite_____. Feldspar_____. Manganese_____.

13—The late John Wetherill for many years ran an Indian trading post at—Shiprock_____. Cameron_____. Keams Canyon_____. Kayenta_____.

14—Going from Tucson, Arizona, to Guaymas, Mexico, you would cross the international border at — Calexico_____. El Paso_____. Nogales_____. Douglas_____.

15—The Havasupai Indian reservation is in—Utah_____. Arizona_____. California_____. New Mexico_____.

16—The metal obtained from a galena mine is—Lead_____. Iron_____. Aluminum_____. Zinc_____.

17—Indians living on the White Mountain reservation are—Navajos_____. Pimas_____. Papagos_____. Apaches_____.

18—The river about which this rhyme was written: *"And if you quaff its waters once, it's sure to prove your bane. You'll ne'er forsake the blasted stream, nor tell the truth again,"* is the—Gila River_____. Verde River_____. Hassayampa River_____. Virgin River_____.

19—The color of chalcedony roses generally is — Deep red_____. Orange_____. Creamy white_____. Indigo_____.

20—The species of cactus generally regarded as the best source of water for the thirsty traveler is—Cholla_____. Prickly pear_____. Beavertail_____. Bisnaga_____.

THE Desert MAGAZINE CLOSE-UPS

Gaston Burridge of Downey, California, has wide interests in science—astronomy, ground water, energy sources and space flight—which his writings reflect. Over 20 publications carried his stories last year.

His "Big Eyes Among Desert Pines" appears in this month's *Desert*. Burridge was born in Tecumseh, Michigan, in 1906, and has been a resident of Southern California since 1927.

* * *

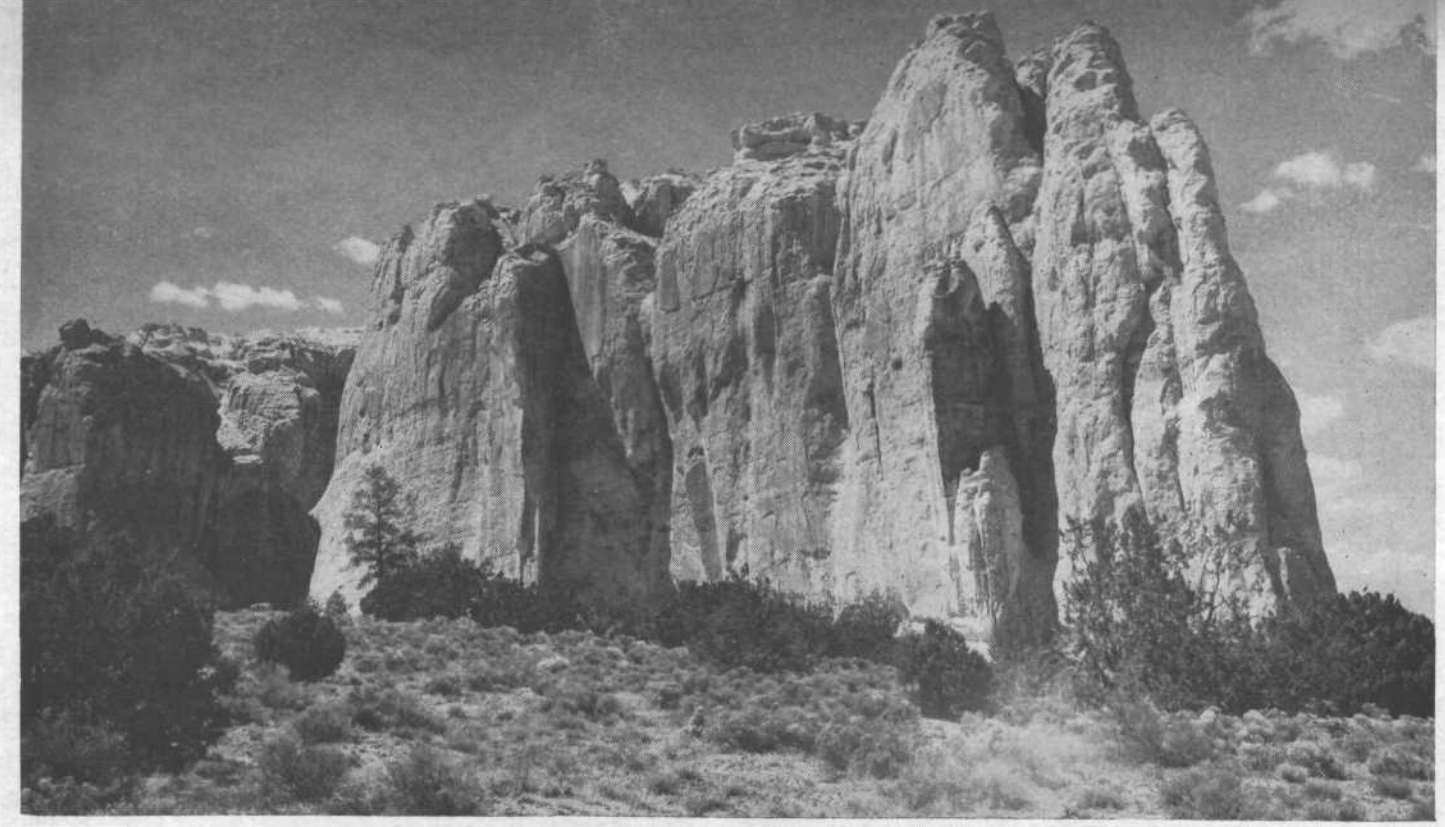
"Guest Register in Stone" is H. N. Ferguson's second *Desert Magazine* story. His "The Great Diamond Hoax of 1872" appeared in the February '57 issue.

Assistant General Manager of the Port of Brownsville, Texas, by trade, he spends evenings and weekends writing articles, fiction and fillers. To date several hundred of his pieces have appeared in print in a wide range of publications. He began his freelance career at the University of Oklahoma where "I practically wrote my way through college," he states.

* * *

For Savola Fenley, author of this month's "Where We Found Happiness," the desert is a way of life. "I spend my time puttering around my hilltop home, doing dried floral arrangements, collecting bits of driftwood, studying wildflowers, reading, visiting friends . . ."

A large purple glass display is Mrs. Fenley's special hobby. When she and her husband were newly arrived on the desert, they visited the old camp sites in the Ridgecrest area and there found many lovely glass pieces, "each with a history and romance all its own."



El Morro. Inscriptions of hundreds of travelers ring the base of this famous New Mexico landmark.

Guest Register in Stone . . .

Down through the centuries, Indians, conquistadores, soldiers and emigrants have camped by the waterhole at the base of El Morro Rock in New Mexico, and many of them have left a permanent record of their sojourn here by incising their autographs on the great stone landmark.

By H. N. FERGUSON
Photos courtesy
National Park Service

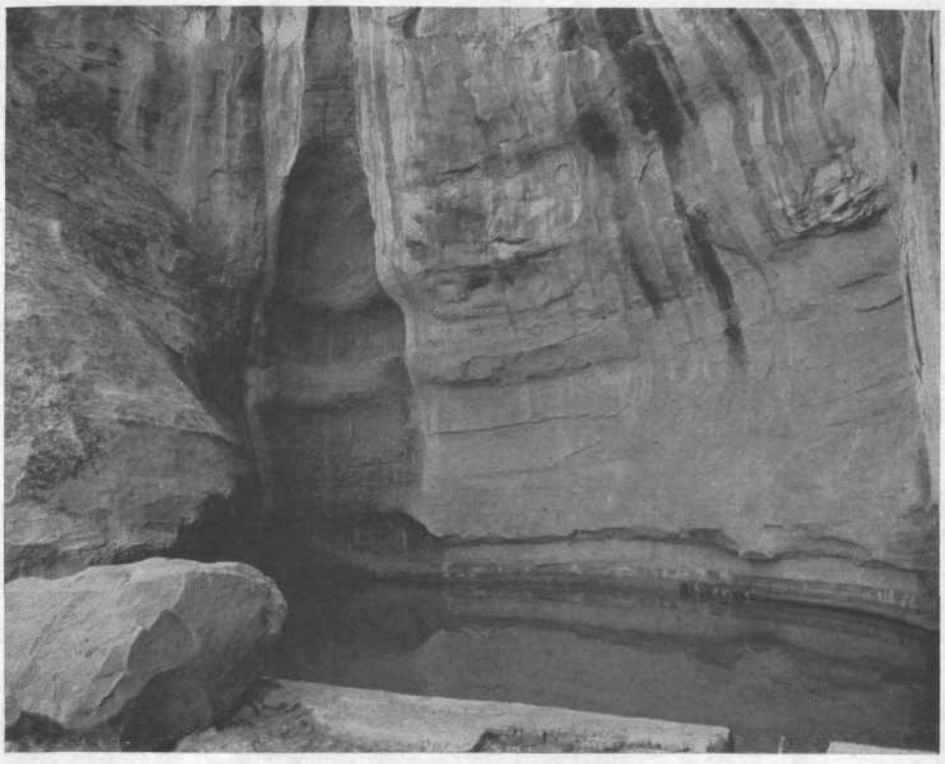
SQUARELY ASTRIDE the legendary trail to the fabled "Seven Cities of Cibola" rises a massive mesa-point of sandstone. A hundred million years ago this strange region rested under the waters of a primeval sea. Today, climbing 200 feet above the valley floor, El Morro—Inscription Rock—is a striking landmark in this sun-washed land.

This "guest book" of solid rock has been collecting signatures since the first Spanish explorers tramped this way in search of treasure. And even before that, undated inscriptions were left by Indians who lived in pueblos atop the cliff. It became a regular camping spot for the conquistadores and, later, for American travelers to the West.

In 1598 Juan de Onate, a wealthy Spanish grandee equipped with six complete sets of armor, set out with 130 families, 270 single men, the first wheeled carriages to enter the region, and 7000 animals—the ancestors of a vast cattle and sheep empire. The colonists settled in San Gabriel del Yunkue, the first Spanish capital of New Mexico. But Onate was a nomad at heart, and in the next several years roamed the western country.

His was the first dated inscription on El Morro. Disillusioned, he and his men were returning from the Pacific Coast where they had learned

The catchment basin at the base of El Morro, once an important water supply for desert travelers.



Some of the autographs left on Inscription Rock by travelers who have passed this way.

there was no truth to the legend that the Gulf of California was overflowing with pearls. Racing against starvation, his party had been forced to eat its spare horses.

While the gaunt men shed their armor and rested before a fragrant fire of pinyon boughs at the base of Inscription Rock, their exhausted leader laboriously etched a message that ignored disappointment, and immortalized his triumph: *Passed by here the Adelantado Don Juan de Onate from the discovery of the Sea of the South, the sixteenth of April,* 1605. It was two years before the founding of Jamestown, and 15 years before the Pilgrims were to step ashore at Plymouth Rock.

Almost a century later another courageous man inscribed a message on the rock which succinctly points up the spirit of that remarkable era: *Here was the General Don Diego de Vargas, who conquered to our Holy Faith and to the Royal Crown all the New Mexico at his own expense, year of* 1692.

On the very top of El Morro lie ruins of Zuni Indian pueblos abandoned long before the coming of the Spaniards. Broken pottery is strewn about. Largely unexcavated, these ruins are covered with the growth of centuries. Here and there a bit of standing wall speaks of the culture that once flourished. Carved on the rock itself are hundreds of petroglyphs left by these ancient people.

The majesty of this jutting yellowish cliff is not lost at close range. The lure of El Morro through the centuries, however, has not been its eminence; but a pool of fresh water at its base. Here Indians, gold-hunting adventurers, and United States Cavalrymen have refreshed themselves and proudly signed the living rock.

The first American Army officer to visit Inscription Rock was Lt. J. H. Simpson in 1846. With him was the artist R. H. Kern who copied the earlier inscriptions.

After Simpson's visit, an intermittent stream of emigrants, traders, Indian agents, soldiers, surveyors and settlers added their names to the rock. Of special interest is the signature of Lt. E. F. Beale. It was he who commanded a caravan of camels, imported as a transportation experiment in the arid Southwest, in a journey from Texas to California in 1857. Beale's use of the route past El Morro popularized that trail, and emigrant trains began to use it. The first such party reached the area on July 7, 1858, and camped overnight. On the rock appears many names carved by its members.

Inscription Rock, 53 miles southeast of Gallup, New Mexico, became a National Monument in 1906. Each year 7000 visitors take the Inscription trail under the supervision of a park ranger.

The leisurely walk around the base of the cliff takes about an hour. Then begins the ascent to the top over the easy loop trail, through small groves of ponderosa pine, scrub oak and juniper. The latter was used a great deal by the Indians for firewood, and was thought to have spiritual and medicinal values.

Scattered along the trail are the ruins of two and three story dwellings, their roofs collapsed and walls caved-in. Sand and grass have almost obliterated them.

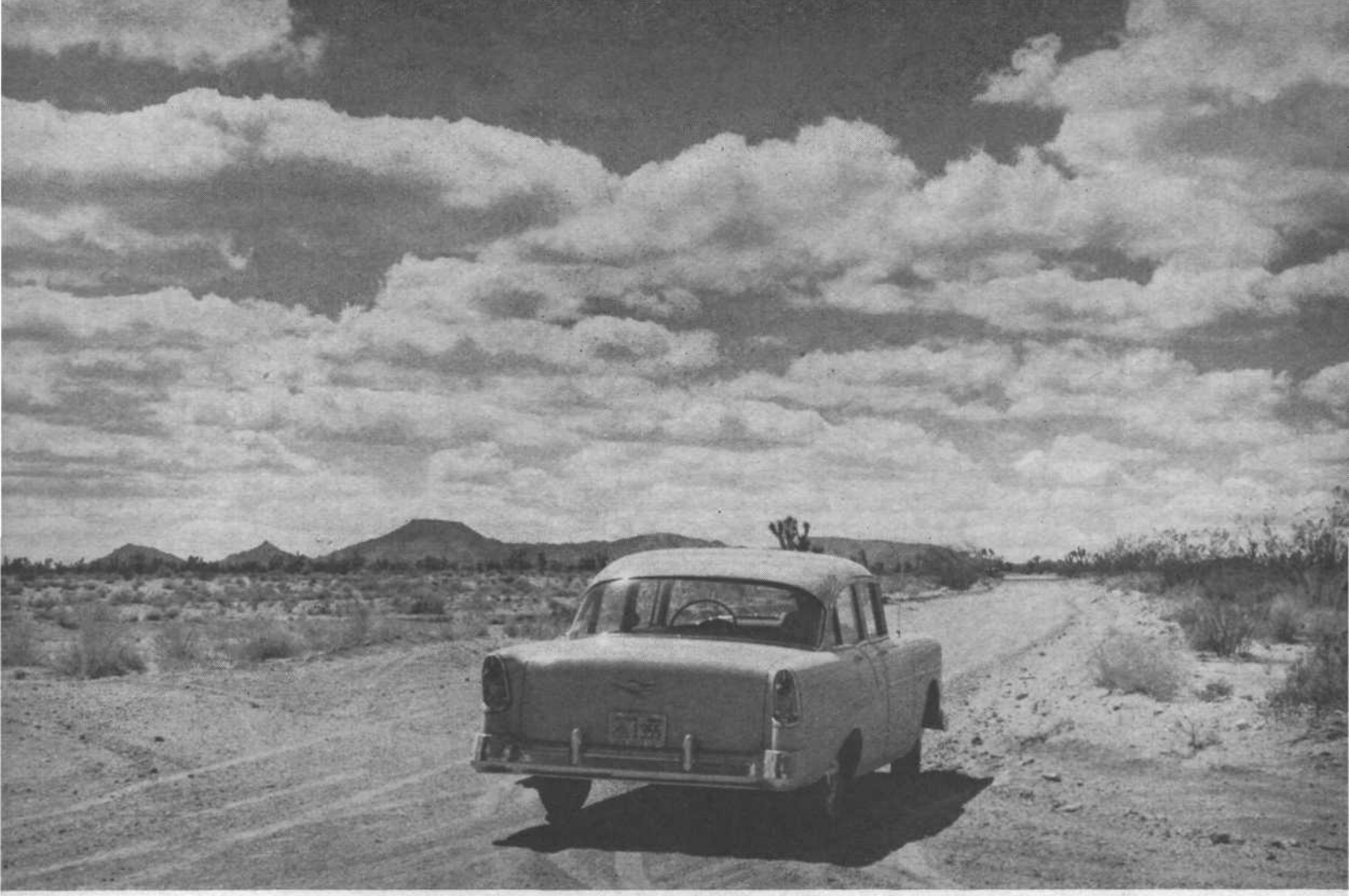
Half way up is a beautiful tree-lined box canyon, invisible from the valley floor. A little farther on is a small seam of coal that was laid down in what was a swamp 50,000,000 years ago.

On the mesa atop El Morro is the deserted site of Atsinna. It occupies an area equal to a city block, and is terraced to provide a southern exposure. Visible are the outlines of old reservoirs carved out of solid rock between the ruin and a grove of trees.

Atsinna was occupied during the 12th and 13th Centuries. No one knows why it was abandoned.

The view from the top of El Morro is spectacular and rewarding—a panoramic vista of canyons and mesas spread out along this natural land route.

Down through the centuries hundreds of travelers from all parts of the world have left their signatures on this huge "guest book" of the desert. But today the book is closed; the Park Service takes a dim view of anyone adding to the list of names. Happily, most visitors respect the historical writings, and realizing that they came to the party too late, resist the urge to add to the register.



Near Marl Springs in the Mojave Desert area newly opened for the desert motorists who like to explore new lands.

Back-Road on the Mojave . . .

Thanks to the interest of a progressive highway department in San Bernardino County, California, a vast new area of desert terrain on the Mojave desert has been opened for the exploration and enjoyment of those who would seek recreation out beyond the traffic of the paved boulevards. The newly completed highway from Baker to Amboy is not paved—but it is a well graded hard road that involves no hazard for those who carry plenty of water and exercise the ordinary precautions of desert travel. Here is a glimpse of the scenic variety along this new route.

By ELIZABETH WARD
Map by Norton Allen

WE DROVE OVER the new Baker - Amboy road, which through 80 miles of scenic desert grandeur links two major highways, one crisp sunny day in mid-January. Although this journey can be made in one day, it is more fun as a week-end camping trip, entering the high Mojave by way of Baker on Highway 91, or near Amboy on Highway 66.

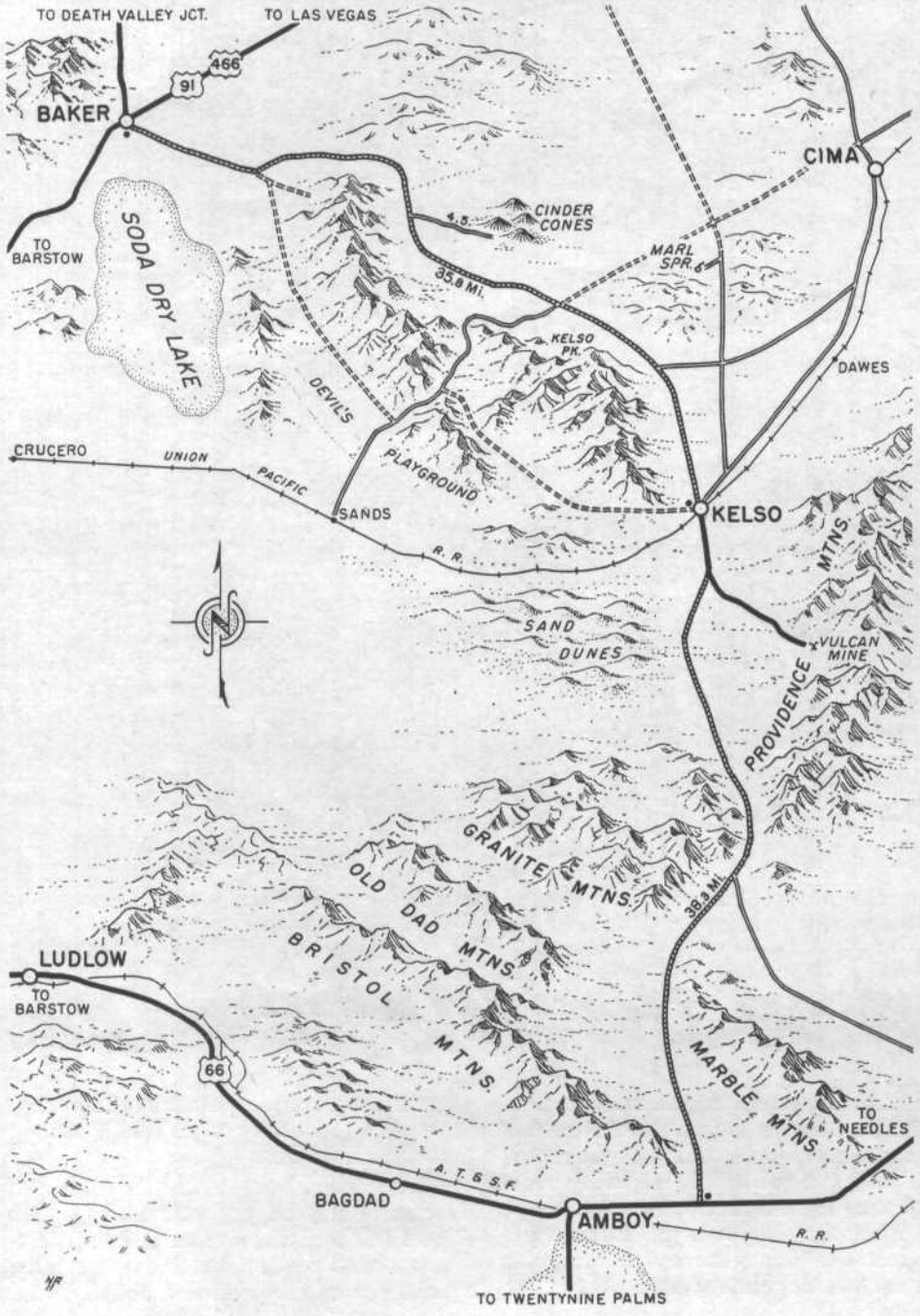
Choosing the latter route, we found our turnoff five miles east of Amboy. Here a new bladed county road leads north, providing easy access to a fascinating land of vari-colored mountains, inspiring views, ever-changing sand dunes, Joshua tree forests, and —near Baker—an almost unbelievable cluster of large extinct volcanoes.

Maintained in good condition, this new gravel road climbed gradually, after we left the main highway. The mountains on both sides of the road are silhouetted against the turquoise sky like colorful painted backdrops of a tremendous stage. Three miles from the highway, one sees evidence of habitation—a mine where the operators live in modern trailers and sleep outdoors the year around. They are surrounded by the Bristol range, and for several miles the pink, upended granite towers run parallel to the road, where a few hardy cattle forage among the rocky ledges.

Proceeding northward beyond the acres of stunted yuccas are the jagged peaks of the Marble mountains. Numerous dim roads lead into these hills, evidence of early mining activity, and 12 miles from the highway are great scars cut across the desert's face by a big pipeline from northern New Mexico, bringing gas to the metropolitan areas of California.

To this point, the bladed road had been very comfortable, allowing an easy speed of 45 miles an hour—fast enough to travel where there is so much to see. But very soon after the pipeline crossing, we encountered the first of a series of steep roller-coaster dips. Although the deep washes are unexpected, the road is entirely negotiable, but care is necessary in driving here, especially if pulling a trailer.

Beyond the dips the route winds uphill, through strange and interesting rock formations. Cholla cactus grows thickly here, with gray ephedra shrubs



and green greasewood dotting the landscape.

Twenty miles from Highway 66, the distant serrated mountains to the north form a contrast to the softly undulating Kelso sand dunes, sparkling white in the foreground. These are the highest and the most spectacular of all California sand dunes, although not the widest in extent. The sands reveal a merging panorama as the light and shadows change, most surprising in this rocky land. The desert winds meet here, eddying between the mountain passes, and deposit their burdens of sand in varying patterns. In late spring, we knew the desert floor surrounding these dunes would be covered with a carpet of desert flowers.

We followed the bladed road, skirting around the sand formations 15 miles, wishing there was a side road where we could drive in closer, but no entrance to the dunes presented itself, except an unimproved road out of Kelso. Perhaps in the future the area will be developed into another White Sands Monument—but only for the peaceful purposes of a winter playground!

An unexpected stretch of pavement met us, four miles from Kelso. This bit of civilization is due to the wartime energies of Henry J. Kaiser, who developed the old Vulcan Iron mines in nearby mountains, and constructed a paved road to his property. The mines are shut down now, but the paved road remains in excellent shape and offers a side trip of unusual interest.

The little green oasis of Kelso is on the Union Pacific. It seemed faintly incongruous to see gleaming rails flung across this vast empty space, but our road crossed them here, and proceeded north by slightly west. However, we digressed the short distance into Kelso, where food and refreshments are available, to ascertain the location of the historic site of an interesting early military outpost, Marl Springs. Being directed to proceed .6 of a mile north on the pavement, and then turn slightly left and follow the telephone line maintenance road 14 miles, we crossed the Baker-Cima cutoff road halfway up, and found the ancient Springs with no trouble.

Here, good water has bubbled up to provide an oasis in the desert since white men first came this way. It was a famous watering place on the old government road, running from Los Angeles to Ft. Mojave on the Colorado River, and a favorite ambush for the savage Paiute Indians until the redoubt was established to protect caravans crossing the desert.

This marvelous spring is fenced in to provide water for a homesteader's cattle, but a portion of the old rock wall of the fort remains, and the deep ruts of the old road are plainly visible. The evidence of many Indian battles marks this area, and arrowheads and other relics of those exciting days may still be found.

The surrounding slopes are covered with staghorn cactus along with beavertail, strawberry, hedgehog, and pincushion cacti, while large specimens of bisnaga or barrel cactus stand out boldly on the hillsides. The location is silent and isolated. A lone desert hawk swooped in wide circles, before alighting on a stunted ironwood tree. This is a wilderness, an impressive reminder of our pioneer heritage, and we ate our lunch in the warm sun, thrilled with the historic environment. Traces of the old abandoned road can be seen around the low mountains east of the Springs, winding down the broad slopes to Cima and Paiute Springs.

In the distance, we could see the spectacular red volcanic rock formations east of Cima—the eroded and deeply colored gorges, and picturesque flat topped mesas, stretching away to infinity, over which remains a part of the great lava sheet said to have covered the whole desert in ancient times. Now there are colorful layers of volcanic ash, sandwiched between thick folds of lighter colored lavas, reminding us of chocolate parfait in giant bowls. The picture is enough to make one's senses reel; there is too great a

The Cinder Cones—now under consideration as a new California state park. Once this area was in violent eruption and today vegetation is just beginning to make its appearance on the surface of the great lava flow.

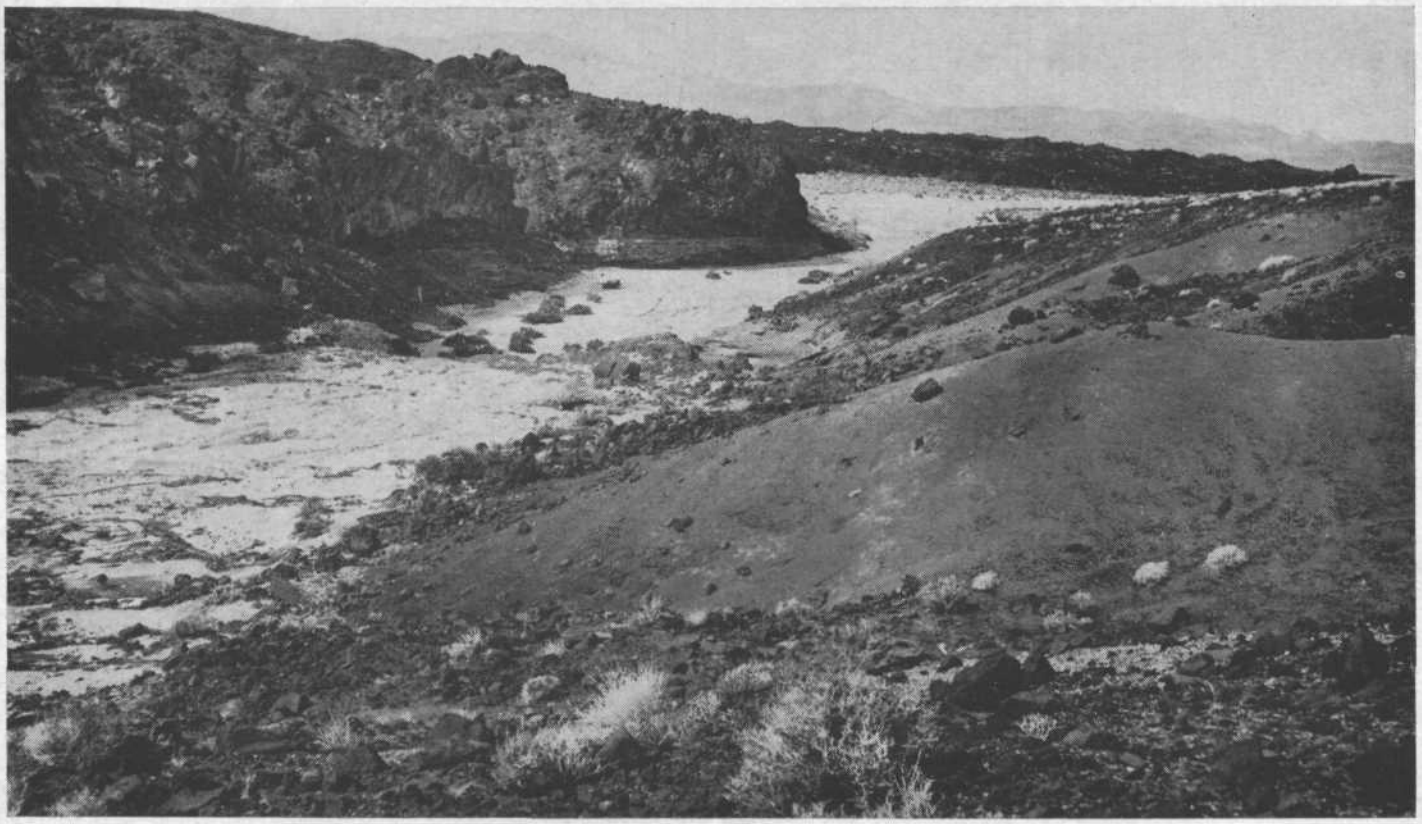
sweep of grandeur, too much of color, for the human eye and mind to grasp in one sitting.

For the view alone, Marl Springs is well worth the extra time and trouble involved in exploration. If there have been no recent floods or washouts, the telephone line road — while rough in places — is perfectly safe for ordinary cars. And it is not necessary to return all the way to Kelso to rejoin the county road; the Baker-Cima cutoff, seven miles below the Springs, intersects the county road a few miles west.

Our feeling is that remote desert roads are a challenge; they reveal much to those who dare. The side roads invite rockhounds to explore new territory, and only the usual precautions of desert travel need be observed. There is enough travel on this road to reassure the stranger, but not enough to spoil the thrill of discovery and exploration the visitor is bound to experience.

Following our detour, we picked up the regular county road toward Baker, and drove on through a section of primitive high desert, where there is no habitation, and tranquility seems to be reflected even in the sunlight. The silence was so intense that we could

Sandy arroyo through the cinder cone area. Wind and water erosion gradually are breaking down the hard basaltic rock spilled on this landscape during its period of volcanic action.



Approaching Kelso from the south the Kelso dunes are seen glistening white against a backdrop of volcanic mountains.

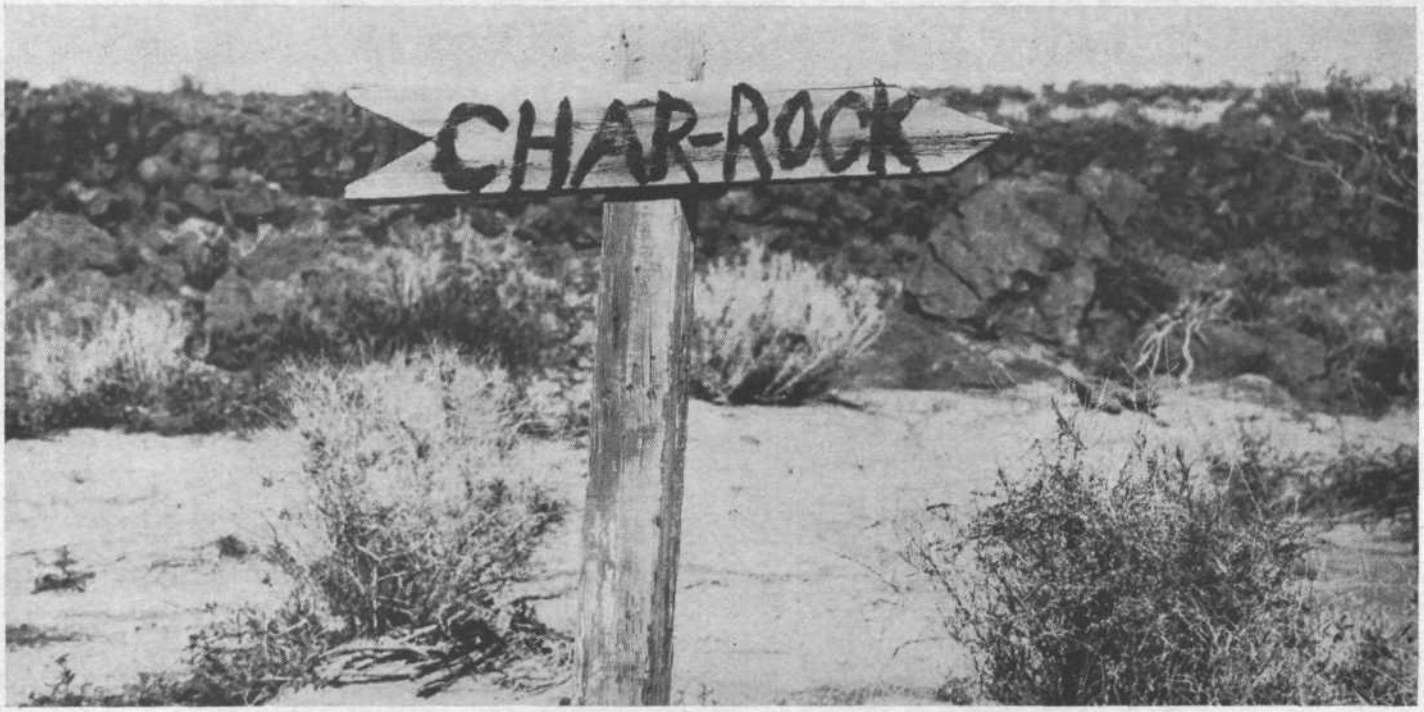
feel it, and our eyes unconsciously swept the rocky peaks for the Paiute smoke signals that surely belonged there!

We were climbing gradually, and soon the nature of the vegetation changed. A giant Joshua, the unusual *Yucca Brevifolia Jaegeri* — so named in honor of the famous desert authority, Dr. Edmund C. Jaeger — stood sentinel beside the lonely road, and *yucca elata* and Spanish bayonet covered the wide sandy sweep of the valley. In late spring the creamy spires of the white flowers are inspiring in their majesty. But the yuccas were soon dwarfed by a veritable forest of the magnificent Joshuas, well spaced so that each fine specimen seemed more impressive than the last one.

Broken black rock formations in the distance were giving us an idea of what to expect, and we were soon rewarded with the sight of the fantastic cinder cones, or extinct volcanoes, that dot this area. Fifteen miles after leaving the Marl Springs cutoff, a fine black-topped road invited us to enter the volcanic site. But a word of warning is in order here: after crossing a bad wash, we found the way blocked by a forbidding sign of the Atomic Enterprises of Las Vegas, Nevada, which, we felt, would have been better located at the fork of the paving, since it necessitated a return to the main road. We have since been advised that the mine is not yet patented, and therefore the road should be accessible to the public, but it seemed the part of wisdom to obey the sign's injunction.

The black lava flow begins near the paving. This sheer malpai wall cannot be ascended for five miles, and so the County road twists around an easy grade until a sign "Char Rock," points the way to a side road up the sandy wash below the malpai wall. This is the beginning of the proposed Cinder Cones state park.

Much work will be necessary before this can become a popular desert retreat, as the present by-road to the cones is not easily negotiable by the average modern car. But, as in the attainment of many other difficult goals, the reward far surpasses the effort. By unloading some equipment and a few passengers, we lightened the burden enough to permit passage over the high centers, where sharp boulders can endanger a low-slung automobile.



Sign that marks the unimproved trail into the cinder cone area. Low clearance cars should not attempt this rocky by-road.

Up the sand wash it is essential to drive carefully. The road is plainly marked, leading up the high malpai wall; but once on top, the far spreading magma almost conceals the tracks of previous vehicles. Here the surface of the earth is hidden; only a solid expanse of black lava can be seen for miles. The visitor is unprepared, even by the work of getting on top of the malpai wall, for the sight that reaches beyond him. This is a never-never land of fantasy, of erosion and solid molten lava, of a black surface with jagged escarpments rising sheer from a malpai floor with so little plant life that it seems to have been lifted, intact, from some strange region from outer space. Nothing grows in the scorched area, except sparse struggling yucca and a few stunted shrubs in cracks, where sand has collected and water has seeped.

Surprisingly, the road improved, after the first pause for our bearings. The Rainy Day Mine signs can be found for 4.5 miles, and although other dim roads branch off toward other hopeful mines, staying on the main road is not difficult. By keeping the most prominent cinder cone always on our left, and heading eastward, the main cluster of eleven large cinder cones was achieved.

This is the main region of the proposed park, and a wonderful camping place for desert enthusiasts who are not daunted by the first high malpai wall. The crumbled valley floors, separating the various peaks, are an "other world" atmosphere for picnics or just plain relaxing. The stark gaunt extinct volcanoes, quiescent now—but providing much evidence of the former violent nature of the desert—offer great scenic vistas, and many trails for hiking and climbing. Perfect obsidian specimens can be found here, and an occasional arrowhead reminder of past visitors to the region. It is safe to hazard a guess that the region was never occupied, even by the usual desert animals.

The State Beaches and Parks department has taken under consideration the plan of creating a desert park, to be called the Cinder Cones Monument. This is the largest group of such cones in the United States, totaling 27 in all, and a site of much interest to geologists and volcanists. Most of the cones are comparatively low and wide, providing easy climbing. The size and shape prove, according to authorities, that the explosions producing them were of short duration but very violent. The cones were built of cooled lava, layer on layer built up during eruptions.

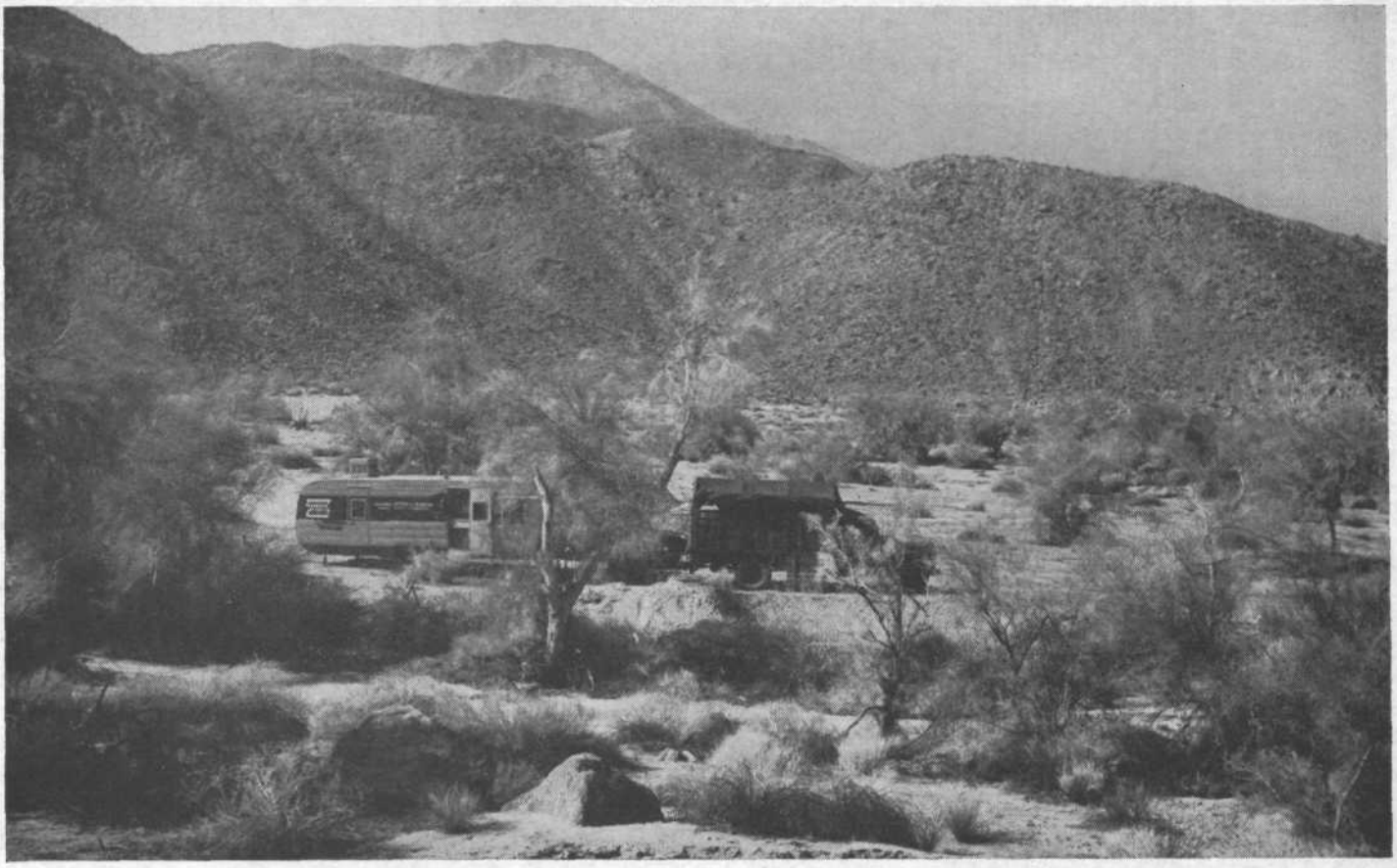
The number and variety of the cinder cones are startling proof of large scale volcanic action in the distant past, but even in the present it is easy to imagine the drama of the erupting volcanoes and the fiery lava as it rolled down the slopes. The black lava flow has descended for miles beyond the stark outline of the extinct volcanoes, to stop abruptly at the sheer malpai wall.

We climbed the basalt slopes, reveling in the isolation, stopping often for especially fine vistas that sweep in all directions from this elevation. In the early twilight, the eerie effect was emphasized when we came back to the car, hungry from the outdoor air and exercise.

The desert stars came out in sharp brilliance that dimmed only after the moon rose. It cast a luminous glow over the ruined face of the scorched malpai, softened the outlines of the peaks, and illumined the rounded contours of the black cinder cones in curved relief. We built our campfire, and cooked our supper in the ethereal light, wishing we could stay on the Mojave a week.

Truly, one day in this world of delightful fantasy is not enough—but if that is all you have, get an early start and don't miss it. There is great attraction and exceedingly great reward in its peaceful isolation and the resulting freedom from pressures—a real panacea to modern tensions.

From the Char Rock entry into the Cinder Cone park area, it is less than a half hour drive over the smooth county road into Baker, and the intersection with Highway 91. But a greater contrast cannot be imagined, than between this busy traffic course and the 80 magnificent miles we had just completed.



This large house trailer has been equipped with all the essential instruments for scientific study of desert plants and animals in their native habitat.

Roving Laboratory of the Desert

By RANDALL HENDERSON

If you wonder what connection there may be between a painstaking study of the life processes of a catsclaw bush on the desert, and the food supply for mankind, you will find some of the answers in this story. Here is a glimpse of the work being done by the men of science who carry on their studies in gypsy fashion on the Great American Desert.

ONE SUNNY DAY in February I followed a winding sand road into an isolated cove at the base of California's Santa Rosa Mountains — and came upon a strange camp scene.

Parked at the end of the road was a huge house trailer and the heavy duty truck which evidently had towed it to this out-of-the-way place. There was nothing unusual about this, for I often meet trucks and trailers on the desert's by-roads. The detail that caught my interest immediately was a little plastic box about the size of a small bird cage perched in a tripod which straddled a pygmy cedar bush.

Enclosed in the box I could see a small branch of the shrub, and attached to the floor of the box were flexible tubes which led to a portable table on which was mounted a panel of dials in an instrument box resembling a portable radio.

Seated at the table was a man, a stop watch in one hand and a pencil in the other, his attention focused on the dials in front of him as he jotted notes on sheets of paper which covered the table.

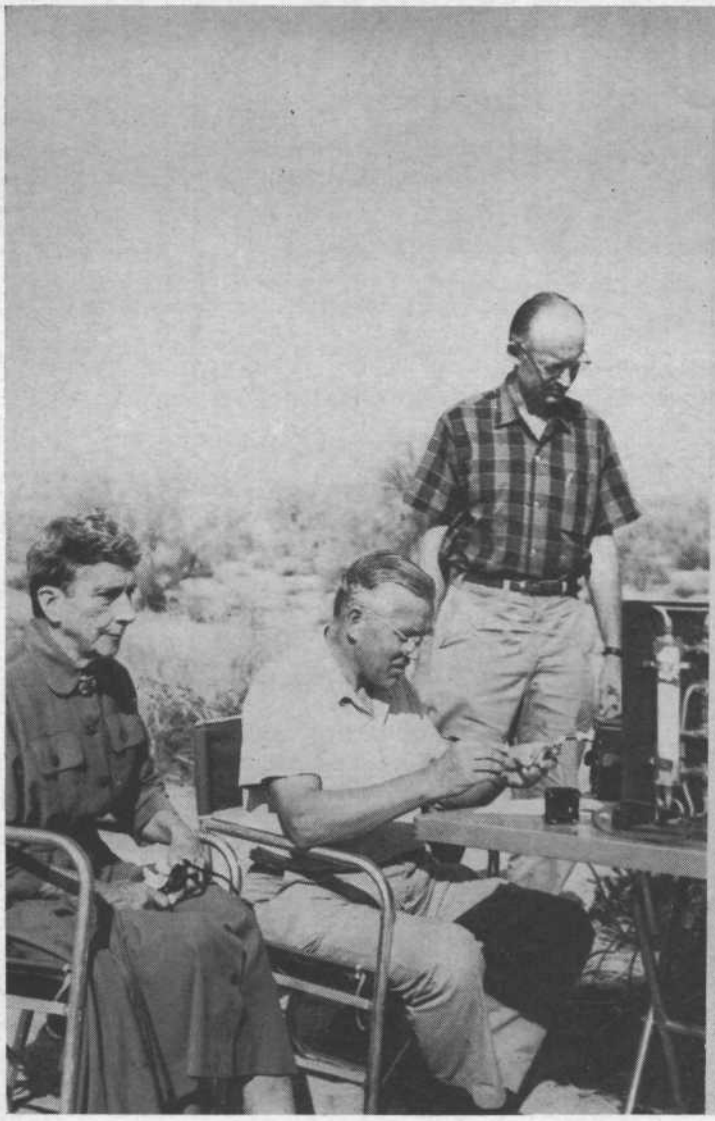
This was my introduction to the Mobile Desert Laboratory maintained by the California Institute of Technology — a gypsy outfit that moves from place to place and gathers information which at some future time may have a very important bearing on the food supply of a world that has become over-crowded with human beings.

I had gone to this camp at the invitation of Lloyd Tevis, Jr., Caltech zoologist who is resident scientist in charge of the Laboratory. Lloyd has been my neighbor here in Coachella Valley for two years, for the home base of the traveling laboratory is the Rancho Senora del Lago, located between Palm Desert and Palm Springs.

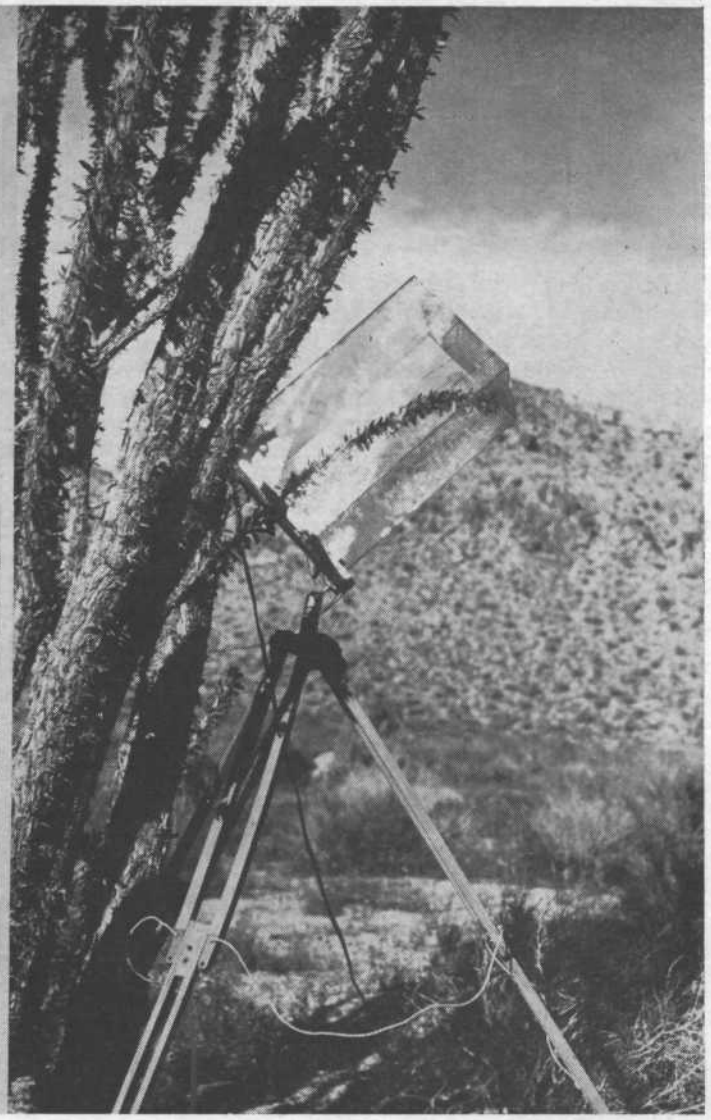
Later that day I had lunch at the trailer site with Dr. Frits Went, professor of plant physiology at Caltech in Pasadena, the scientist whom I had seen at the instrument panel earlier in the day. The lunch was served on a card table in the shade of a Palo Verde tree by Lillian Overland, laboratory technician who helps Dr. Went ride herd on the array of dials and valves involved in his studies.

Dr. Went, widely recognized as an authority in his field, spends much time at the mobile laboratory on the desert studying the dials and recording data which will give human beings a better understanding of the natural laws which govern the universe.

That day, Dr. Went had three of his plastic cages working on pygmy cedar,



Left to right—Mrs. Austin McManus, Frits Went and Lloyd Tevis, Jr., on location in the desert.



Measuring the carbon dioxide intake and the water vapor and oxygen output of the ocotillo.

creosote and catsclaw. Later, in March, I visited the Laboratory again when it was stationed in a remote canyon in Joshua Tree National Monument. This time the plastic boxes and dials were recording the photosynthesis and transpiration of ocotillo, jojoba, and Canterbury Bells, a species of *Phacelia*.

Most people are aware of the fact that every living plant is a little factory, using radiant energy from the sun, taking in carbon dioxide and moisture, and converting them to sugar and other compounds which have food value for the plant and animal world, and giving off water vapor and oxygen which help maintain an atmosphere conducive to life on this planet. But it is only in recent years that the scientists and technicians have perfected instruments which make possible an intensive study of the exact role of plants in the ecology of life in general. Dr. Went is doing important pioneering in this field of study.

For instance, of the six desert shrubs mentioned above, he has ascertained that pygmy cedar probably is the most useful from the standpoint of mankind. And yet pygmy cedar is an insignificant shrub known to few people outside of the botanical world. It is an evergreen two to four feet high which often is seen growing apparently without soil in the cracks and crevices in the sidewalls where road-building crews have blasted through for a roadbed. It is conspicuous along the Palms-to-Pines highway in Southern California.

In areas of greater rainfall, plants generally take in most of their water supply from the soil through their root systems. But it is a characteristic of many desert shrubs that they depend also on the pores of their leaves for absorption of moisture.

While Dr. Went carries on his plant studies, Lloyd Tevis is devoting his research to the desert animal life. His current study is ants and mites. His method is to stake out typical colonies of these tiny insects and study their work and social habits through their complete life cycles, keeping detailed records of his findings.

And if you wonder what importance attaches to the study of ant life, I can only quote the conclusion of a leading scientist who has stated that in the course of evolution the ants, the family *Formicidae,* have attained a higher degree of organization than any other form of life on earth except man. They have farmers and nurses and policemen and baby-sitters, each functioning in the role to which he is born.

It has long been known that one of the main contributions of the ant world to the success of other forms of life is in the pulverization of leaves and deadwood. They supplement the work of sun and water in adding organic matter to the soil. They help fertilize the earth. A single ant colony would not make an important contribution—but when it is realized that there are billions and billions of ant colonies of

Mrs. Austin McManus of Palm Springs whose interest made possible the equipping of Caltech's field laboratory.

many hundreds of species scattered over the face of the globe, all working industriously in the service of mankind, it will be recognized that they play no small part in converting organic materials to food for other forms of life.

Stationed in tropical Africa during several months of World War II, I learned about an odd by-product of the industry of ants in that area. In the African Gold Coast, now the dominion of Ghana, the ants, as in many other tropical lands, build hills six and eight feet high. To keep these pinnacle-like structures intact, they glue the grains of sand together with a secretion which they manufacture for that purpose. The British had discovered that the abandoned ant hills could be removed and pulverized, and then mixed with water and used as surfacing material for tennis courts and patios. One of my assignments was to build two tennis courts with this material. It is not as permanent as cement, but served very well under the circumstances.

And so, Lloyd Tevis is studying ants, their role in the ecology of the desert, and especially their reactions to extremes in temperature and changing weather conditions. The ants are great seed-gatherers, and in long periods of drouth their food supply is affected—just as it is for human beings.

Caltech's Mobile Desert Laboratory is carrying on much the same type of research as was the Carnegie Institute's Desert Laboratory at Tucson. However, the Tucson laboratory was discontinued after one of its main buildings was burned in 1939. The Earhart Laboratory at Caltech also has been doing important research in botany, but much of this kind of work can be done to better advantage in the field—in the natural habitat of the plants and animals.

Dr. Went has long advocated the construction of a laboratory which would be mobile—one which could follow the rains from place to place, and move to the different life zones. His idea was realized in the summer of 1956 when Mrs. Austin McManus, whose father pioneered in Palm Springs 70 years ago, and who is an active civic leader in that community, provided the funds for the truck and

These instrument panels are recording the photosynthesis and transpiration of pygmy cedar, a branch of which is enclosed within the plastic box.

house-trailer, and also for some of the needed scientific instruments.

On the truck is mounted a 4000-watt generator and an air-compressor, the power plant for the laboratory. It carries 500 gallons of water under pressure and 70 gallons of gasoline. The trailer has both refrigeration and evaporative air conditioning equipment.

The big trailer is a biological laboratory with a maize of scientific apparatus — microscopes, balances, tubes, valves, tables and cupboards. Since the scientists may be out in remote areas for extended periods, the facilities also include kitchen stove, refrigerator, hot water heater and shower—a self-contained unit in every detail except sleeping quarters. Members of the staff spread their bedrolls on the ground outside, which is seldom a hardship in the desert.

The Mobile Laboratory operates not only for the benefit of the faculty at Caltech, but its facilities and findings are available for scientific men and women all over the world. On one occasion when I visited the Laboratory two Australian scientists were present over the weekend. At another time Dr. Jane Philpott, professor of botany at Duke University, on sabbatical

Roots in the Water--Fronds in the Sunshine

California's native palm, the *Washingtonia filifera,* more than any other tree in the arid world, depends on water for its life and growth. The ironwood, the palo verde or the smoke tree may survive for years on the scant rainfall of the desert country—but the palm will wither and die in a few months if there is no moisture at its roots. Its shallow root system requires either a high underground water table, or generous irrigation.

This characteristic of the native palm, and the manner in which it responds to a generous water supply, is well illustrated by the two pictures above.

These two palms are the same age. Both are native volunteers from Paul Wilhelm's oasis at Thousand Palms, California. At the age of three years they were transplanted to the *Desert Magazine's* garden in 1950—each of them two and one-half feet high at the time.

The two pictures were taken seven years later. The palm on the left had been watered by irrigation once a week during the summer months and less frequently during the winter. It was four feet high when the picture was taken—after seven years.

The palm on the right, planted at the same time and irrigated from April through October by a constant stream of warm water—the discharge from the *Desert Magazine's* air-cooling plant—grew to a height of 10 feet in seven years. It grew over a foot a year, while its twin, with much less water, gained less than three inches a year. Both are healthy trees, planted in the same kind of soil, and with the same amount of sunshine. The difference is due entirely to the water they received—nothing else.

If you want your palms to grow faster, simply give them more water.

leave for a year with a A.A.U.W. Fellowship, was carrying on anatomical studies. When I entered the laboratory she was looking through a microscope at the cross-section of an ocotillo leaf. It resembled a tiny thread, barely visible to the naked eye, but when I looked through the lens of the microscope what I saw appeared to be clouds of green chlorophyll suspended in a river of clear fluid. It is chlorophyll which directs food manufacture in the plant and gives the leaves their coloring.

Present also on this weekend were two scientists with their families from Sweden. They had brought camp gear and were using every daylight hour to tramp over the desert hills and arroyos, making new acquaintances among the flora of the desert world.

Frits Went and Lloyd Tevis are working in the realm of pure science. It is the research of such men and their associates which back through the years has provided the basic data with which technicians in the field of applied science have created the implements and formulas that have given to Americans the highest living standards on earth.

They and their kind are studious men, patient, painstaking scholars who bit by bit are revealing and interpreting the natural laws of the planet, and of the universe beyond.

To these men, and to women with the vision and understanding of Mrs. Austin McManus, Americans owe a great debt of gratitude for the services they are rendering. I should mention also the cooperation of Ruth Rooke, who raises desert holly as a commercial enterprise on her Coachella Valley ranch. When the scientists were seeking remote campsites where they could carry on their studies uninterrupted by curious visitors, she arranged for her ranch equipment to build and maintain a road to one of their hideouts.

At a time when Americans are becoming cognizant of the need for more intensive school curriculums in the realm of science, the work being done by such men as Frits Went and Lloyd Tevis is opening new worlds for the instruction of youth—and adults too, for that matter.

LETTERS

Status of the Fish Traps . . .

South San Gabriel, California

Desert:

Recently my husband and I made a trip to the Coachella Valley to again visit the Fish Traps, the mysterious Indian pits along the ancient shore line on the Santa Rosa Mountains' foothills.

We were distressed to find that the signs had been moved back toward the public highway, and that the dirt road which leads to the base of the Fish Traps had been partly destroyed.

This road has been used by the public for over 100 years. Can the people farming the land below the Fish Traps close it off?

WILMA SPANGLER

Dear Mrs. Spangler—The property in question, including the Fish Traps, is owned by Mrs. Lloyd Rooke, a very public spirited person and one who I am sure fully appreciates the archeological value of the Fish Traps. We sent your letter to her, and here are excerpts from her reply: "We have not moved signs at the Fish Traps—we have added more signs. Any damage or change to the signs has been done by hunters. The road of which Mrs. Spangler speaks was destroyed by a flood down the wash, and we are restoring it. However, we intend only to keep the Fish Traps available to the public. The access to our farm from the Fish Traps road will be chained. If it were only desert lovers who used the road, I am sure we would not mind. However, we cannot be responsible for people swimming in our reservoir, driving over our row crops, etc., and I am distressed by the utter disregard the public seems to have for private property. I am sympathetic with those who deplore the constant withdrawal of once free land to private use; perhaps when there are more stringent laws enforced against hunters, we can all relax our vigilance."—R.H.

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Taylor's Flag Outdated? . . .

Los Gatos, California

Desert:

The flag flying above the old town of Taylor, Nevada, (*Desert,* May '58) shows five rows of seven stars each—35 stars.

If Taylor's old-timer is correct in dating the photograph 1881, could it be that the flag shown was outdated 17 years? The flag had 35 stars in 1864 when Nevada—the 36th state—was admitted to the Union.

GLENN HOLMES

• • •

This Elephant Is a Mosquito . . .

Los Angeles

Desert:

Josef Muench's May '58 cover photograph is entitled "Mosquito Rock in the Valley of Fire State Park, Nevada." I have always been led to believe that this fantastic formation is the "Elephant Rock."

ARTHUR C. DAVIS

Dear Mr. Davis — Mr. Muench writes that the rock he photographed is three miles distant from the formation designated by signs as "Elephant Rock." The name "Mosquito Rock" for the formation we reproduced on our cover, was told to him years ago by a friend. There has never been a sign, to his knowledge, at the Mosquito Rock.—R.H.

• • •

The Taste of Cardon Fruit . . .

Fresno, California

Desert:

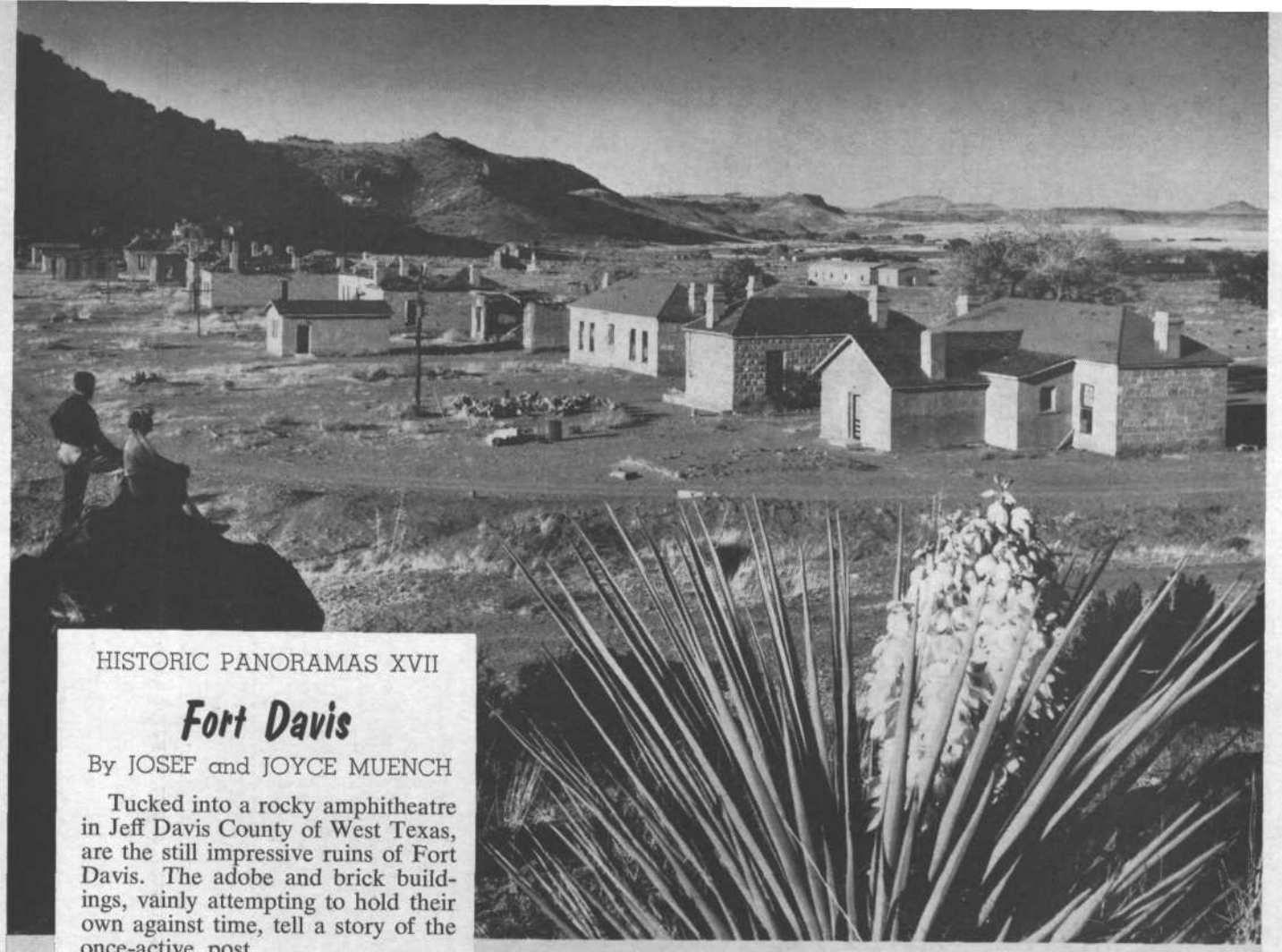
In the April, 1958, *Desert,* in the article "Dirt Road Holiday," there appears: "Evidently, the natives make regular roads to pick the fruit. Split open with a knife, the magenta colored pulp is revealed. This is eaten along with the seeds in the fruit's center . . . Cardon fruit is sweet and delicious . . ."

But in the December, 1956, *Desert,* in the article "The Cardon, Largest Cacti in the World" there appears: "The Indians who once inhabited the area ground the fruit pulp and seeds into a flour from which they made a kind of tamale."

Which statement is correct? There seems to be a contradiction. I'm not being picayune, but would like to know if the fruit is "sweet and delicious."

J. D. STEPHENS

Dear Mr. Stephens — Dr. Edmund Jaeger, in writing the cardon story for our December '56 issue, was referring to the use made of cardon fruit by the Jesuit padres and the Indians of that period—over 150 years ago. The "Dirt Road Holiday" story contained the observations of Norte Americanos as of today. I have no doubt both observations are correct—but they come from differing races of people and from widely separated periods. Food tastes and habits change through the years. Your question as to whether cardon fruit is "sweet and delicious" is not so easy to answer. I can only suggest that some folks like tomatoes, but to my palate they are bitter and sour. The cardon fruit is somewhat similar to the saguaro fruit in Arizona. The Indians who have been eating it all their lives think it is delicious, but I have found only a few white people who share that liking for them. Too many seeds for one thing. If you will pick a ripe tuna, or "cactus apple" from one of the prickly pear cacti which grow in your area, you will get a fairly good idea of what they are like.—R.H.



HISTORIC PANORAMAS XVII

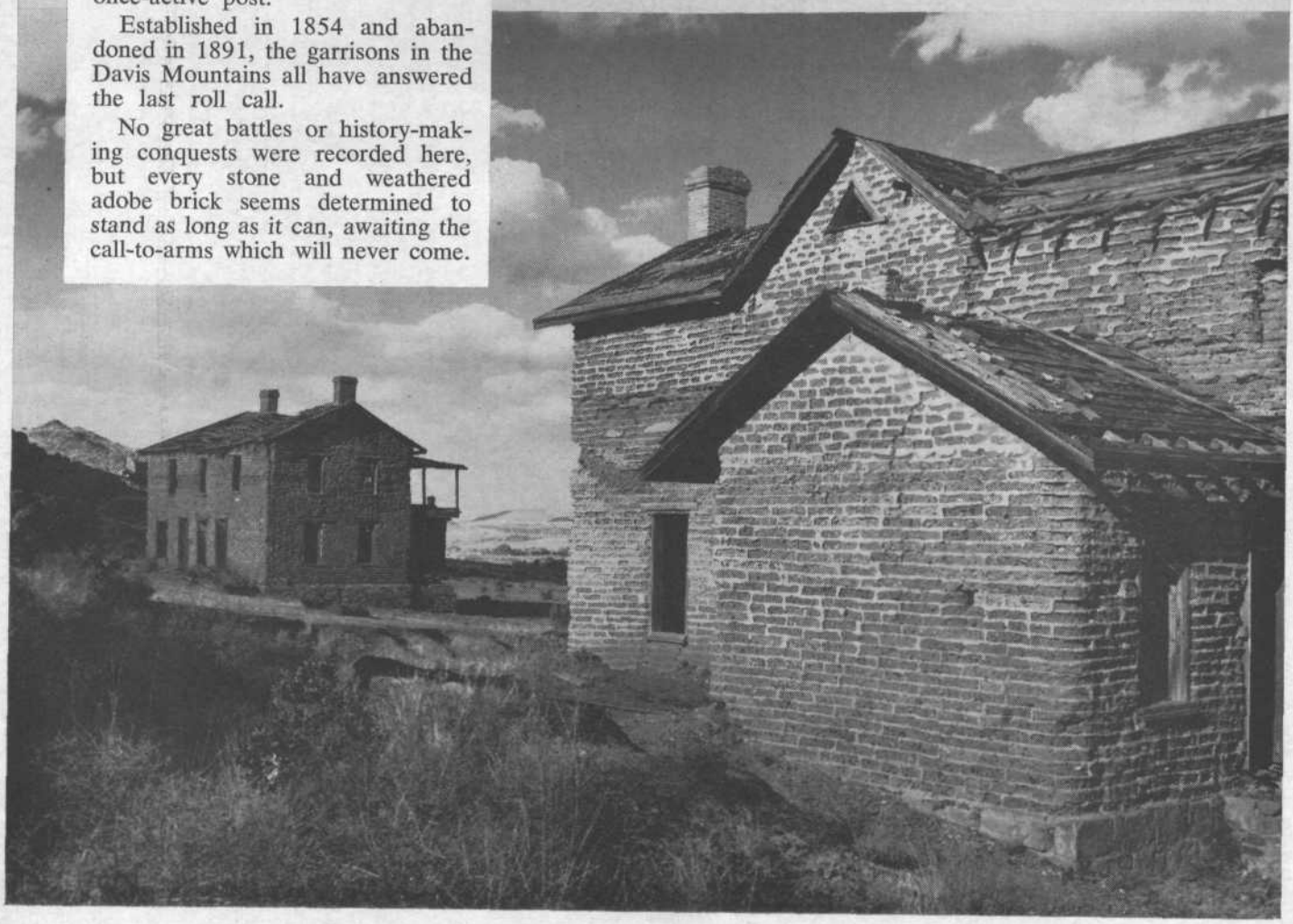
Fort Davis

By JOSEF and JOYCE MUENCH

Tucked into a rocky amphitheatre in Jeff Davis County of West Texas, are the still impressive ruins of Fort Davis. The adobe and brick buildings, vainly attempting to hold their own against time, tell a story of the once-active post.

Established in 1854 and abandoned in 1891, the garrisons in the Davis Mountains all have answered the last roll call.

No great battles or history-making conquests were recorded here, but every stone and weathered adobe brick seems determined to stand as long as it can, awaiting the call-to-arms which will never come.



ON DESERT TRAILS WITH A NATURALIST --- LI

River of the Bitter Waters

The long J-shaped Amargosa River is no ordinary river—even compared to other desert streams. It drains one of the earth's most arid basins—and empties its scant heavily mineralized water onto the great salt flats on Death Valley's floor, lowest region in the Western Hemisphere.

By EDMUND C. JAEGER, D.Sc.
Curator of Plants
Riverside Municipal Museum
Map by Norton Allen

ALONG WITH THE Mojave, the Amargosa (Ah-mahr-go-sah) River is one of the strangest streams in the Southwest. Seen from high in the air, the course of its bed looks like a giant letter J, with the hook of the letter pointing toward the south. Like the perverse Mojave (*Desert,* June, '57), it is an erratic upside-down river flowing much of its way beneath its bed —the second longest underground river in the world.

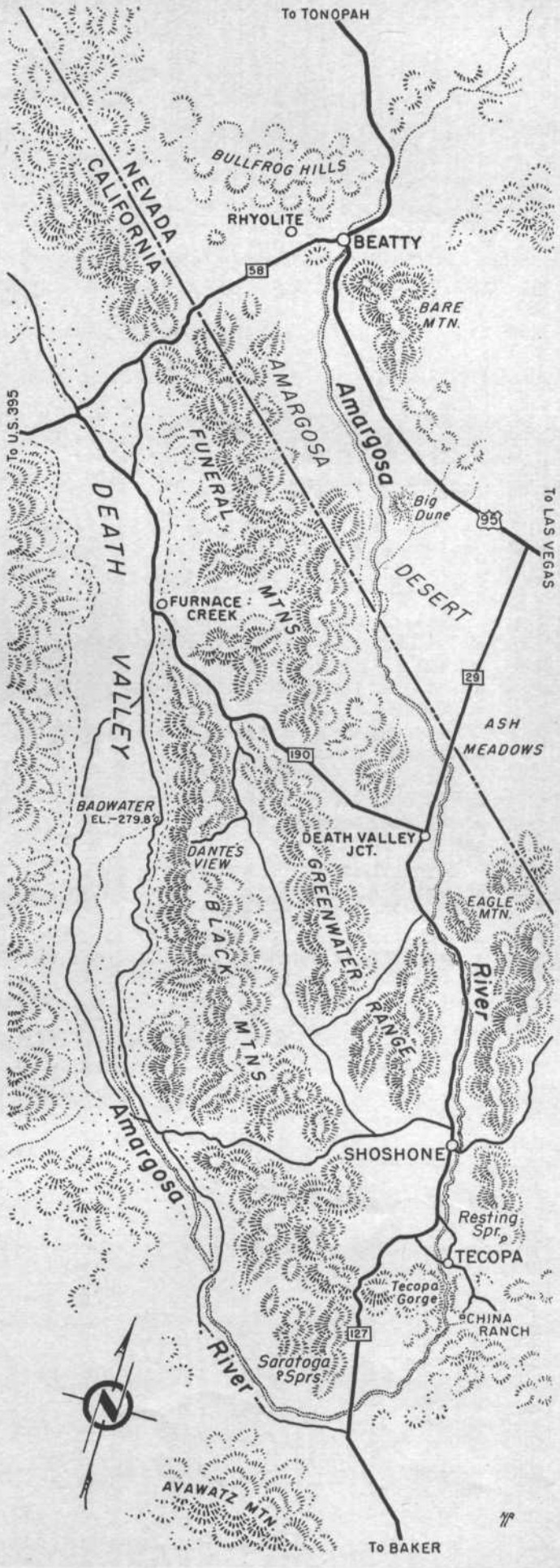
Instead of flowing into another stream or the sea, the Amargosa empties into a salt-encrusted dry lake bed—the below-sea-level salt flats on the Death Valley floor near the lowest point in the Western Hemisphere.

This below-sea-level ending is a distinction shared with few rivers on earth, among them the Jordan in Asia Minor, which empties into the Dead Sea 1292 feet below the level of the Mediterranean; and the Volga, Ural Emba and Kuma which end their courses in the salty Caspian Sea, 83 feet below the level of the Black Sea.

The Amargosa is a river only in the sense that it is the main drainage channel for one of the largest intermountain basins in the West. Like the Mojave, it is an intermittent stream with little or no water flowing over most of its bed except in unusually wet years or after very heavy summer cloudbursts.

The drainage area of this river begins in the high, much dissected and picturesque Paiute Mesa of western Nevada, 30 miles north of Beatty. From this area several large and usually dry channels merge near the old mining towns of Rhyolite and Beatty to form the river proper. Here waters appear from springs in the hills and mountain country to flow through a broad treeless brush-covered valley five to eight miles broad and 50 miles long, lying parallel and east of the California-Nevada state line. This region usually is called the Amargosa Desert.

For some distance south from the small oasis of Beatty with its attractive cottonwood trees, the river channel is for the most part marked by only a shallow, rather broad and somewhat sandy wash. It proceeds west of the beautiful high sand hills known as the Big Dune, then southward through the salt and alkali plains of Ash Meadows where in ancient times its waters were impounded to form a broad but shallow lake. Here on the flats of Ash Meadows are a number of springs around which grow bunch and salt grass, sunflowers and a few leather-leaved ash trees (*Fraxinus coriacea*) from which



The Amargosa River, foreground, northwest of Saratoga Springs. Spence air photo.

the Meadows received its name—not from the ashy appearance of the salt and alkali encrusted soil as is often assumed. From specimens taken here, this ash tree was first described by Sereno Watson, author of the two-volume *Botany of California,* published in 1876.

Five miles south of Death Valley Junction, the Amargosa's channel passes to the west of sublimely beautiful Eagle Mountain, an isolated peak lying in the center of the broad valley floor. This landmark is noticed by every traveler passing north or south on the road between Baker and Death Valley.

Just south of Eagle Mountain the stream bed of the Amargosa is so near the road I was able to see and hear the water as I traveled this way in April. Nearby I also saw the old roadbed of the torn-up Tonopah and Tidewater Railroad which runs beside the river in many places.

Near the village of Shoshone, set so charmingly amidst the greenery of mesquite, tamarisk and screw bean trees, the numerous colorful terraces and smooth rounded or highly eroded clay beds give evidence that this is an ancient lake bed of considerable size. The Pleistocene lake reached as far south as Tecopa, was as much as 400 feet deep, and covered an area of at least 100 square miles. For many years Lake Tecopa discharged through a low lip between the hills at its southern end. Finally, it cut a gorge so deep in this spillway that its waters drained away, leaving only the long-accumulated clay sediments. This clay was eroded away by wind and rain to form the fantastic fortresses and castellated buttes seen along the road as it crosses the old lake bed just west of the village of Tecopa.

The Tecopa Lake region was familiar to many early travelers. Captain John C. Fremont passed this way in the spring of 1844, stopping at the nearby Archilette, a place of lively springs which he afterwards called Agua de Hernandez in honor of a lone Mexican he found there, the only survivor of a party attacked by Indians.

This cheerful spot of green willows located a few miles north of well-known Tecopa Hot Springs, later was called Resting Springs by a party of Mormons who camped here in May, 1851, on their way to San Bernardino. It still retains that pleasing name.

Tecopa came into being when the Tonopah and Tidewater Railroad, built by the borax interests, established a station here. A branch line, which brought ore and minerals from the Gunsight and Noonday mines to the east, joined the T&T at Tecopa.

The name Tecopa was given in honor of old Chief Tecopa, a Paiute Indian long resident in the area. He died about 1905.

One of the old engines—abandoned, rusting and stained with white alkali dust—for a long time stood in the sun at Tecopa, a sad picture of neglect. I am told it finally was sold for scrap. Nostalgic memories go back to when I first saw it in 1928. My companions and I had come down a long rough road from the Kingston Mountains during a howling April wind storm. It was late evening and we came across the old engine as we hunted for a camp site. An eerie sound fell upon our ears as the wind shrieked and whistled through the pipes, wheels and glassless windows of the cab. Extra strong gusts frequently tipped the bell and made the clapper strike against its sides.

An old chicken shed was the only place offering a semblance of shelter, and there we bedded down. All through the cold noisy night, the sturdy engine's bell lamentingly clanged away, and no one got much sleep.

Just south of Tecopa is the grand Tecopa Gorge. At its broad entrance are many acres of near-swampland covered with the cheerful green of low mesquite and screw bean trees, cattails, rushes and other water-loving plants. Beyond, steep hills of clay and conglomerate close in to form a narrow scenic gap through which the river channel passes. The Tonopah and Tidewater built its roadbed through this pass.

Five miles down the gorge the unusually beautiful cliff-bordered canyon

Entrance to Tecopa Gorge. Photo by the author.

of Willow Creek opens up. At Willow Creek's upper end once stood the Tecopa Smelter.

At the canyon's lower end, where a rather large level area is set like an amphitheater among beautiful steep hills, is the China Ranch. Here since the early borax days Chinamen grew vegetables to supply the nearby mines. The ranch has changed hands many times, and the present amiable and ambitious owners are doing much to clean up the clutter of old machinery, long neglected buildings and broken fences on the property. They plan to restore the fields and trees to their former beauty. The ranch house is set in a lovely enclavement of green amidst magnificently colorful and eroded Tertiary Age rocks. The large cottonwood trees are worth going many miles to see. Protected from winds, they have grown unusually big, and have taken on most graceful forms. Water comes from a number of local springs, some to the northeastward with sufficient flow to irrigate many acres.

An unusual number of birds are found at isolated China Ranch. Some stop to nest, but most only stay for a short rest from their migratory journeys. All day long but especially in the early hours of dawn, there is a pleasing variety of bird song. In April it was my privilege to see the brilliant flashes of red of the male vermilion flycatcher and of his plainer-colored mate. These birds appear year after year, and often nest on the ranch.

One of my great ambitions is to hike down the Amargosa's bed as it descends, at first rather steeply and then more gently, through its gorge. I will be able to leisurely observe the many wonders of its natural history—plants, animals and geological features. It is in one of the embranchments of this gorge that paleobotanists recently unearthed fossil palm remains.

Up one of the branches of Willow Creek talcum is found, and along the road leading down the scenic steep-walled wash to China Ranch gypsum deposits in the consolidated sediments have from time to time enticed miners to dig into the embankments.

Once beyond Tecopa Gorge, the small stream, laden with salts and alkalis, turns westward over a sloping alluvial fan and past the southern toe of the Black Mountains and Saratoga Spring. Then it swings north and makes its way to the great salt flats, the last remnant of historic Lake Manly, in the lowest part of Death Valley. There its waters are evaporated by the sun.

Last November I saw from Dante's View the river's many dividing end-

Hard Rock Shorty of Death Valley

The loungers on the porch of the Inferno store watched the tow car pass in a cloud of dust.

"Huh!" exclaimed Hard Rock Shorty. "Bet somebody's stuck on that road up to Eight Ball Crick. Lots o' quicksand up that way.

"Yu can't always tell about that quicksand," Shorty went on, "Some folks think wet sand is the only kind that's quick. But that dry sand up Eight Ball way is jest as bad. When the car drops down to the runnin' board that's quicksand, wet or dry.

"Navigatin' that Eight Ball crick road is jest like boatin' on the ol' Missouri River—yu gotta know your channels t' git through it.

"Wunst I seen a feller sinkin' down in that dry sand. He wuz clear in to his chin, hollerin' like bloody-murder. I throwed 'im a piece of pipe to breath through till I could git help. But it wuzn't necessary. One o' them whirlin' dust devils came along jest then — a big walloper it was — and sucked him right outta that hole.

"Ol' Pisgah Bill found a trace o' gold in that sand wunst. He figgered the deeper he went the more gold there would be on account o' gold bein' heavier than sand. So he got him a pair o' snow shoes and set up a dry washer out there in the middle o' one of them shoals o' quicksand. But next mornin' the dry washer was nowhere to be seen. After losin' three dry washers an' a burro, Bill done gave it up."

Amargosa stream near the Baker to Death Valley Road. The salt-laden river flows for miles through sere barren desert. Photo by the author.

streamlets spreading out on the valley floor like silver strands reflecting the light of the setting sun—a beautiful and unusual sight indeed.

The Spanish word Amargosa means bitter waters. The river is sometimes described as a river of salt flowing through a desert. Where the little stream flows under the Baker-Death Valley Road, the rocks on its bed are so salt and alkali encrusted that they are cemented together into a solid mass, and can be extricated only with considerable difficulty.

It is considered quite possible that until fairly recent geological times, the flow of Amargosa River was not disconnected as it is today. Furthermore, it may have been a tributary of the Colorado River, a theory supported by fish evidence. Some of the small minnow-sized fish now found in creeks and isolated pools in the Amargosa drainage system show relationship to Colorado River fish. Dr. Robert L. Miller reports three subspecies of cyprinodont fishes and a local form of dace (*Rhinichthys*) inhabit pools and streamlets of Tecopa Basin. No fossil fish have yet been found to definitely fix the age of the Lake Tecopa clay beds.

East of Tecopa, between the Nopah and Charleston Mountains, lies sprawling Pahrump Valley. It too once contained a fresh water lake, and there is evidence that its overflow discharged through Ash Meadows into the Amargosa River. It takes little imagination to envision the Amargosa as a much larger stream, with lakes along its course and tributaries augmenting its flow.

I have found the exploration and study of arid region rivers a most fascinating pastime. It is an especially good hobby for those who own Jeeps. Each desert stream has carved its path through charming country, and all have individual peculiarities. Many of these streams played important roles in the lives of aboriginal inhabitants as well as the early explorers, trappers and miners.

SOUTHWEST WATER PICTURE BRIGHT AS SUMMER ARRIVES

Rainfall over the Desert Southwest's three main river basins varied considerably in April: the Colorado received much below normal, Great Basin near normal, and Rio Grande much above normal amounts.

If precipitation during the summer months is near normal, the water-year (October, 1957, through September, 1958) flow of the Colorado River above Glenwood Springs, Colorado, is forecast to be near 85 percent of the 1938-52 average. Near average flow is expected for the Blue River and the Roaring Fork; Taylor River, 115 percent of average; Uncompahgre River, 130 percent; Dolores Basin, 115-125 percent. Flow of the Colorado River near Cisco, Utah, is forecast to be 98 percent of average.

Near 90 percent of the 1938-52 average runoff is forecast for the extreme headwaters of the Green River in Wyoming; Yampa and White rivers, 120 percent of average; Green River at Green River, Utah, 92 percent; San Juan Basin, average or above average.

The expected runoff for the major streams of the Salt Lake Basin is 125 percent of the 1938-52 average, except for the Bear River where near average is forecast.

Streamflow of the Humboldt River is expected to be 90 percent of average. Above average runoff is in prospect for the Truckee, Carson, Walker and Owens rivers. Current outlook for the Mojave River is for streamflow in excess of 150 percent of the 1938-52 average.

Average, or above average, runoff is forecast for all streams of the Rio Grande Basin with the exception of Alamosa Creek and the Conejos River in Colorado, where near 90 percent of average is expected. Runoff of the Río Grande at Otowi Bridge, New Mexico, is forecast to be 105 percent of the 15-year average.

Big Eyes Among Desert Pines

Three important observatories are probing the mysteries of outer space in dry clear northern Arizona, one of the world's most important astronomical centers. Science long ago discovered what anyone who has camped here on a calm moonless night knows—the sky is filled with billions of stars, each seemingly so close one can reach up and touch them.

By GASTON BURRIDGE

NORTHERN ARIZONA'S high, dry and sparsely populated Coconino Plateau has been known as a superior place to set astronomical telescopes since the early 1890s. Recently I talked to a retired astronomer who played an important part in selecting the Southern California site for the huge 200-inch Hale telescope, the biggest reflector in the world. He told me Palomar Mountain was chosen purely on economic grounds, not because that mountain's "seeing" qualities were superior to several northern Arizona sites which were extensively tested. There is one mountain top near Prescott which is exceptionally excellent.

The tremendous population growth of Southern California has rendered Mt. Palomar and Mt. Wilson considerably less valuable as observatory sites. It could come to pass that the economic considerations used in the choice of Palomar might prove a poor anchor in the vast storm of population growth.

A hub of astronomical activity has been generating around Flagstaff since 1894 when Percival Lowell established the Lowell Observatory here. He made this region famous with his many books, the material for which he gathered on Mars Hill above Flagstaff.

Impetus as an astronomical center was added to this area when the U.S. Navy built its Flagstaff Station, and the Air Force established its Atmospheric Research Observatory.

The skies over Washington, D. C., like those over Los Angeles, have become polluted with man-made impurities, and "light-filled" from added artificial illumination. The U. S. Naval Observatory in the capital found the 40-inch Ritchey - Chretien reflecting telescope — its largest light-gathering instrument — becoming less and less effective. Thus, moving it to a location with less smoke and light was desirable.

Dome of the 42-inch reflecting telescope at Lowell Observatory. Photo by the author.

After a nation-wide search, the Navy chose a site five miles west of Flagstaff just south of Highway 66.

Dr. Arthur A. Hoag is in charge of the Flagstaff Station. He is a young man, tall and smiling, and proud of his station, which, like all other Navy installations, is spotless. This observatory also has the excellent services of Dr. Elizabeth Roemer, expert on comets and astroids. Joseph P. Egan, a fine instrument maker, completes the staff.

The observatory is situated at 7600 feet elevation, 600 feet higher than the city of Flagstaff which can plainly be seen from the observatory's front door. Dr. Hoag explained that during the summer, the observatory's night temperature is 10 to 15 degrees cooler than Flagstaff's, while the winter daytime temperature is 10 to 15 degrees warmer. This favorable condition is caused by the air drainage into Flagstaff from the high San Francisco Peaks above it.

The Flagstaff Station is an astronomical observatory without a dome. Here, the entire roof of the room holding the telescope rolls away. The roof is on wheels set on tracks, and is locomoted by an electric motor. With the

Dr. Earl Slipher, Lowell director and world authority on Mars. Photo by J. T. Adendorff.

roof completely removed to the north, the telescope is open to the entire sky.

The northern Arizona plateau often is windy, and wind blowing against a telescope will jar it, blurring an image for visual or photographic observation. That cannot be tolerated. Hence, the walls of the observatory room are double, the inner ones capable of being lifted by hydraulic means. Once in position, they effectively block the wind.

The Station maintains a complete machine shop on its premises, containing many late design precision machine tools. Here also is a well equipped darkroom for developing, printing and enlarging photographic plates.

While the permanent staff of the observatory resides in Flagstaff, the Station has a kitchenette and comfortable sleeping quarters for visiting astronomers who frequently come to study here. Completing the facility are two offices, a large instrument room where telescope appendages are stored, an ample garage, and general storage space.

All buildings are on the same floor level which facilitates movement of equipment—some of it very heavy—to and from the telescope.

The 40-inch mirror has to be realuminized occasionally, though not as often as in Washington because of Flagstaff's dryer climate. To carry out this operation, the floor immediately surrounding the telescope lifts and sinks by hydraulic mechanism, thus eliminating the need for an overhead crane to move heavy parts of the instrument.

The newest observatory to add a big eye to the high pines of the Flagstaff area is the Atmospheric Research Observatory on the campus of Arizona State College. This observatory is supported in part by the Cambridge Research Center of the Air Research and Development Command, and operates under an Air Force contract. Dr. Arthur Adel is director.

The A.R.O. is not as astronomical as the other observatories on this plateau, for study here concentrates on the effect of the sun and of cosmic rays on our atmosphere. I could not learn what research currently is being furthered here, because Dr. Adel's work is classified. He is a specialist in the study of infrared radiation, and began this work at the University of Michigan in 1931. Many of his findings are of import to our missile and astronautic flight development programs.

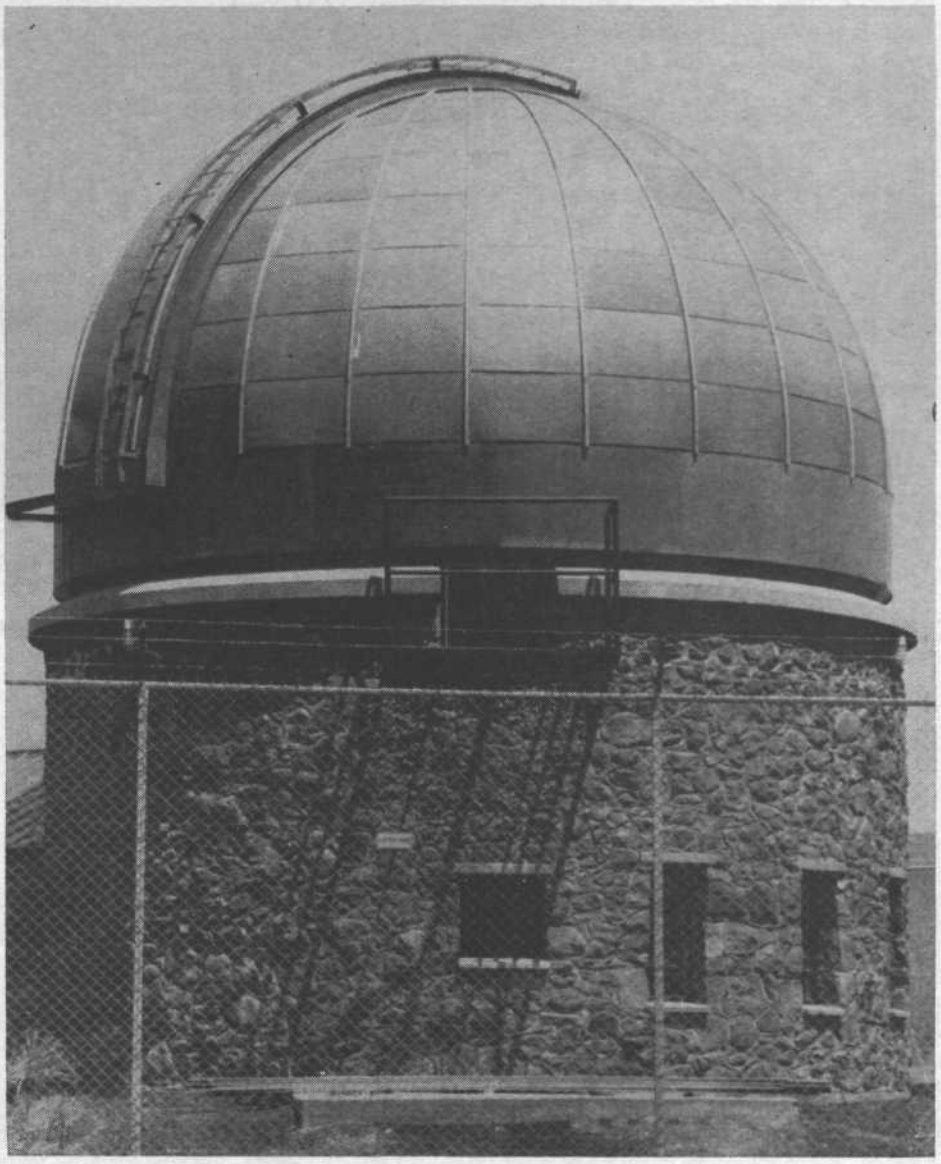
Although the function of A.R.O. is not to study heavenly bodies, clear dry quiet air is essential to its success. This explains why the observatory was established here.

The A.R.O. explores present and seasonal conditions in the earth's atmosphere, particularly in the stratosphere (36,000 feet) and the troposphere, all that portion of the atmosphere lying below the stratosphere.

The instrument used here is a very special kind of telescope, technically known as an "Infrared, 24-inch with a primary focal ratio of f. 4.5." It is equipped with monochromators and spectrometers, infrared sensitive detectors.

Certain radiation wave lengths in sunlight and perhaps of cosmic rays charge certain constituents of our atmosphere. This charged matter, either immediately or in due course, emits

Air Force's Atmospheric Research Observatory. Arizona State College photo.



Comet Arend-Roland, 1956. Official U. S. Navy photograph taken at the Naval Observatory's Flagstaff Station.

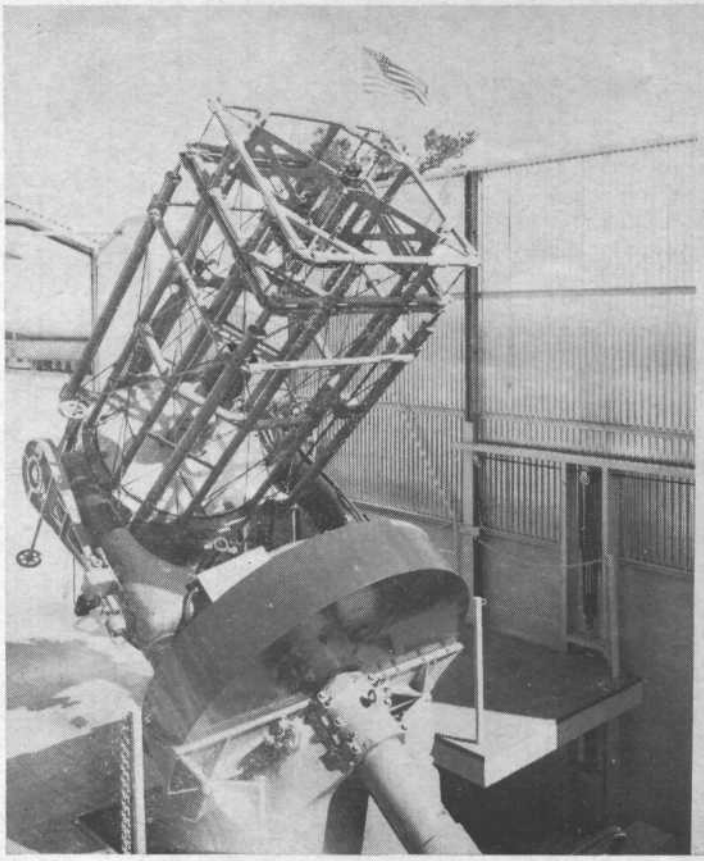
infrared radiation. It is these radiations which are studied at A.R.O. by Dr. Adel. Infrared wave lengths are measured in microns—0.000039 inch —and even in tenths of microns.

The science of infrared radiation is relatively new, and Dr. Adel is one of the comparatively few experts in this field. Among his most noteworthy accomplishments was the discovery of deuterium hydroxide in our atmosphere.

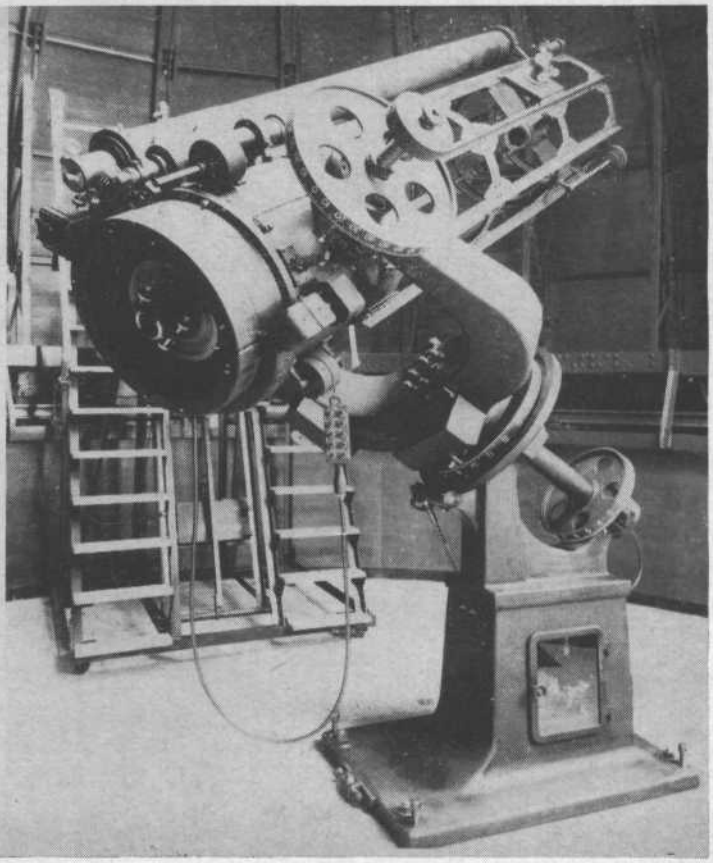
The observatory on the Coconino Plateau having the most, the largest and the oldest eyes, and surrounded by the greatest number of pines, is Lowell Observatory. Founded 64 years ago, it is the oldest astronomical observatory in the Southwest. The site covers 700 acres, and contains several permanently-mounted telescopes.

The largest big eye on the plateau at present is located here—the 42-inch Alven Clark and Sons reflector. This telescope was erected in 1909. Second in size at Lowell is a 24-inch Alven Clark and Sons refractor, which has been in service since 1894. A third telescope, a 13-inch refractor, was donated by Dr. A. Lawrence Lowell, long-time president of Harvard University and brother of the observatory's founder. This instrument was put in commission in 1929, and is the telescope with which Dr. Clyde Tombaugh photographically discovered Pluto, the

40-inch telescope at the Naval Observatory's Flagstaff Station. Inner walls of the building are in raised position to protect the instrument from the wind. Official U. S. Navy photo.



24-inch infrared telescope at the Atmospheric Research Observatory on the Arizona State College campus. Instrument studies effect of sun's rays on atmosphere. Arizona State College photo.



ninth planet of our Solar System, in 1930. Tombaugh's success was the result of prediction and research originated in 1905 by Dr. Lowell.

The observatory possesses other telescopes and much astronomical equipment. It has a dome, but it is not a conventional type. Generally, a dome is placed atop a cylindrical building, but at Lowell, the 42-inch reflector rests in a walled pit, and the dome is at ground level.

Two other Lowell telescopes are covered with revolving truncated cones containing slits through which the telescopes can view the heavens. Still another telescope, a 15-inch one, stands beneath a removable roof similar to the one at the Navy observatory.

Lowell is a mile west and 350 feet higher than Flagstaff, on a pine-covered mesa named Mars Hill by the observatory founder.

Dr. Lowell was director from 1894 until his death in 1916. He was succeeded by Dr. Vesto M. Slipher who retired from the directorship in 1954. While Dr. Slipher has no astronomical research projects at the observatory at present, he still resides on the grounds. One of the most significant discoveries made at Lowell—the "red shift of the outer galaxies" which is related to the Expanding Universe theory—was the work of Dr. Slipher.

Dr. Albert G. Wilson was director of Lowell from 1954 to 1956, and Dr. Earl Carl Slipher, Dr. Vesto Slipher's brother, is the observatory's present director.

Dr. Earl Slipher, who has been with the institution as an astronomer since 1906, probably is the world's leading authority on Mars.

The observatory's main building contains the astronomers' offices and laboratories. This imposing two-story stone structure is the center of the institution's activities, and contains photographs, drawings, books and mementos left by many of the world's greatest astronomers, some of whom worked here. At present, Lowell's staff has nine astronomers and technicians.

Lowell Observatory is open to the public from 1:30 p.m. to 2:30 p.m. every day except Sundays and Holidays. During the summer months from June through August, Lowell has regularly scheduled night visiting hours on every other Friday. Verification of the dates should be made before planning to visit the observatory at night.

Daytime visitors receive a lecture in the library and then visit the telescope. There is no charge for this tour.

Here and There on the Desert . . .

ARIZONA

Parker Indian Lease Canceled . . .

PARKER — The government canceled the development lease on 67,000 acres of Indian land near Parker with the Colorado River Enterprises, Inc., headed by Stanford W. Barton. Under the original agreement, the firm was required to post a $5,000,000 performance bond, which it failed to do. The 25-year-lease was awarded last August 13 amid much publicity regarding the many benefits the Indians would accrue from the transaction. Immediately following the latest government move, new proposals for development of the 110,000 acres of the Colorado River Indian Reservation were being pushed. Progress on a plan to turn the reservation over to the Indians to develop on their own initiative, free of Indian Bureau control, also was reported.

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Javelina Decline Causes Told . . .

PAYSON—Ralph A. Fisher Sr. of this city takes exception to recent statements by game management specialists that drouth conditions are the chief cause of sharp declines in javelina population. Fisher lists eight "adverse conditions" which he believes are responsible for the wild pig's decline: 1. increased hunting pressure brought on by expansion of population; 2. practice of home, road, railroad, etc., construction crews in slaughtering javelinas; 3. use of poison on open range; 4. drouth—not a major cause, for the javelina can migrate to more favorable areas; 5. natural causes of death, and the fact that sows only bear two pigs a year, and sometimes only one; 6. predators — especially coyotes; 7. year-around poaching by ranchers and their hired riders — the biggest cause of the decline and the one few sportsmen will accept; and 8. the hunter who is not a sportsman. —*Phoenix Gazette*

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Navajos Kept from Jobs . . .

WINDOW ROCK — An attorney for the Navajo tribe charged that Indians have been prevented from working on their own reservation. Laurence Davis of Phoenix said private contractors building roads on Indian lands have not given preference to Indians in hiring. The Federal government handled the construction projects prior to 1954, and up to that time Indians had been given employment preference. Davis also said Indians have had trouble with unions on reservation projects.—*Yuma Sun*

Medicine Men Losing Influence . . .

WASHINGTON, D.C.—Paul Jones, chairman of the Navajo Tribal Council, believes Indian medicine men are fast going out of business, losing out to the white man's medicine. Jones gave this testimony to a senate subcommittee in support of appropriations for Indian health. "A great majority of my people are convinced that the public health service can more effectively cure their ills than the native medicine man," Jones said.—*Phoenix Gazette*

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Land Trade for Dam Site . . .

PAGE—Legislation has been introduced in congress which will permit the Navajos to obtain 53,000 acres of land in Utah's San Juan County in exchange for their lands which will be flooded by the Glen Canyon Dam. The bill is the culmination of more than two years of negotiations. Under the terms of the agreement, the Indians will retain mineral rights at Page and the Federal government will keep mineral rights in San Juan County.

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Glen Dam Bridge Started . . .

PAGE — Construction is underway on the Glen Canyon damsite bridge which, upon completion, will be the nation's highest and second longest steel arch span. The bridge will link a $10,000,000 highway system in

THE DESERT TRADING POST

Classified Advertising in This Section Costs 12c a Word, $2.00 Minimum Per Issue

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BARRY STORM—famed writer-publisher-explorer "Thunder God's Gold," "Practical Prospecting," "Tales of the Southwest," (see cardex files most libraries), now has ready for publication:

THE MOUNTAINS
THAT WERE GOD

—fantastic factual story of Lost Peralta and Lost Dutchman Mines, based upon author's treasure hunting expeditions in Arizona's sinister Superstition Mountains mining district and location of gold-bearing region verified by one rediscovered mine, relics, other actual evidence. Popular-priced book considered capable making dozens to one profit on publication, national exploitation costs during 28 year copyright. Need 50 only copyright co-owners underwrite costs of $40 per 1/100th co-ownership, payable $10 down, $10 monthly for three months. I operate deal, own 50/100ths, pay profits every six months. Publishing contract for actual copyright co-ownership sent on approval or upon receipt first payment. State number 1/100th co-ownerships wanted. Storm Publishing Associates, Box 74, Inyokern, California.

INDIAN GOODS

SELLING 100,000 Indian relics. 100 nice ancient arrowheads $25.00. Small grooved stone tomahawk $2.00. Large grooved stone tomahawk $3.00. Perfect spearhead over 8 inches long $20.00. Flint scalping knife $1.00. Indian skull $25.00. Ancient water bottle from grave $7.00. List free. Lear's, Glenwood, Arkansas.

FINE RESERVATION-MADE Navajo and Zuni jewelry. Old pawn. Hundreds of fine old baskets, moderately priced, in excellent condition. Navajo rugs, Chimayo homespuns, artifacts. A collector's paradise! Open daily 10 to 5:30, closed Mondays. Buffalo Trading Post, Highway 18, Apple Valley, California.

AUTHENTIC INDIAN JEWELRY, Navajo rugs, Chimayo blankets, squaw boots, old Indian collection. Closed Tuesdays. Pow-Wow Indian Trading Post, 19967 Ventura Blvd., East Woodland Hills, Cal.

THREE FINE prehistoric Indian war arrowheads $1. Flint scalping knife $1. Rare flint thunderbird $3. All for only $4. Catalog free. Arrowhead, Glenwood, Ark.

TOTEM POLE, 14 foot, $150. Tepee and poles, $125. Buffalo hide shield, $175. All old genuine. Bernard, Box 972, Santa Cruz, California.

MAGIC KACHINAS—Now you can practice the age-old Pueblo Indian art of carving wooden replicas of the "magic" Kachina beings. Booklet contains complete carving instructions, authentic patterns, and descriptions of six figures; a map of the Southwest Indian Pueblo area; and the story of the Hopi Indians and kachinas. Photos of the six kachina figures appear on the back cover. Only $1.00 prepaid. Order your "Magic Kachina" Booklet now from Ethos Publishing Co., P.O. Box 5056, Phoenix, Arizona. Include 10 cents for mailing and handling.

CLUBS — ORGANIZATIONS

ARE YOU interested in prospecting for minerals, or rockhunting? Write for literature to United Prospectors, 701½ E. Edgeware, Los Angeles, 26, California.

MAPS

SECTIONIZED COUNTY maps — San Bernardino $1.50; Riverside $1; Imperial, small $1, large $2; San Diego 50c; Inyo, western half $1.25, eastern half, $1.25; Kern $1.25; other California counties $1.25 each. Nevada counties $1 each. Topographic maps of all mapped western areas. Westwide Maps Co., 114 W. Third St., Los Angeles, California.

TREASURE MAP. Fifty lost mines, treasures, and wrecks. History of each included. $1. Prospector, 3915 Lamont, San Diego 9.

CALICO MAPS—Calico Ghost Town road map; rockhounds' trail map. The only accurate guides to the Calico Mountains. Both maps for 25c per set. Write: Calico Maps, Box 86, Etiwanda, California.

REAL ESTATE

SALTON SEA. See us for acreage large and small. Also homesites and business sites. Pon & Co., 711 N. Azusa Avenue, Azusa, California.

MUST DISPOSE of these Goldfield, Nevada, properties: 4-room house and five cabins on 200-foot Highway 95 frontage —ideal motel site; 4-room house on two lots; three-lot parcel. Also must sell gold, silver, copper and sulphur mining claims. Moser, P. O. Box 176.

JOSHUA TREE cabin for rent, furnished or unfurnished, just 2½ miles from town on Monument Road, paved highway, high desert. Write owner, Arthur Kikkert, Post Office Box 299, Joshua Tree, Calif.

40 ACRES overlooking Salton Sea. Fine citrus land. $30,000. Ronald L. Johnson, Broker, Box 162, Thermal, California.

DESERT ACREAGE—5, 10 and 20 acre parcels. Boron, Kramer, Adelanto, Barstow and other areas in all counties. Terms as low as $10 down and $10 month. Davis Desert Properties, 12175 Washington Blvd., Los Angeles. EX 8-2781, TE 0-1975.

URANIUM MINES for lease or sale, 45 miles south of Hanksville, Utah. Spring water, good camp, good mines. Claude Simonds, Hanksville, Utah.

WESTERN MERCHANDISE

FREE CATALOG: Western wear, boots, saddles, leather supplies. Silver Spur, Box 1785-JJ2, Fort Worth, Texas.

MISCELLANEOUS

LADY GODIVA "The World's Finest Beautifier." For women who wish to become beautiful, for women who wish to remain beautiful. An outstanding desert cream. For information, write or call Lola Barnes, 963 N. Oakland, Pasadena 6, Calif., or phone SYcamore 4-2378.

ASSAYS. Complete, accurate, guaranteed. Highest quality spectrographic. Only $5 per sample. Reed Engineering, 620-R So. Inglewood Ave., Inglewood, California.

GHOST TOWN ITEMS: Sun-colored glass, amethyst to royal purple; ghost railroads materials, tickets; limited odd items from camps of the '60s. Write your interest—Box 64-D, Smith, Nevada.

MAKE DELICIOUS Rancho Cookies. No baking, no fussing. Your friends will love them. Secret instructions 50c. Mrs. Vermeulen, Box 172, Rancho LaPaz, Anaheim, California.

10,000 TONS dumps and tailings. Want man with truck and loader to haul. 50-50 deal. J. S. Wisdom, Lida via Goldpoint, Nevada.

WORTHY GEOPHYSICAL development project needs capital. For information write today. Harold Deck, 1610 Foxworthy, San Jose 24, California.

DESERT QUIZ ANSWERS

Questions are on page 10

1—Mined from the ground.
2—Beaver.
3—Lost mine.
4—Yucca.
5—Rio Grande.
6—Yuma.
7—Nevada.
8—Mortar or metate.
9—Tree rings in the roof timbers.
10—Red.
11—Daylight pass.
12—Calcite.
13—Kayenta.
14—Nogales.
15—Arizona.
16—Lead.
17—Apaches.
18—Hassayampa River.
19—Creamy white.
20—Bisnaga.

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southern Utah and northern Arizona. During construction, the dangling arch will be suspended from 100-foot towers on each rim of the canyon. The bridge is expected to be open to traffic by February of next year.—*Salt Lake Tribune*

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JEROME—Robert S. "Pop" Clanton (*Desert*, April, '56) passed away in mid-April. Known as the Old Prospector of Jerome, he was 74 years of age.—*Verde Independent*

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CALIFORNIA

Salton Sea Pollution Denied . . .

BRAWLEY — A charge made by Dick Lane, water pollution chairman of the Southern Council of Conservation Clubs, that waters of the Salton

Sea were shockingly contaminated, was denied by Terrence Donovan, executive officer of the State Regional Water Pollution Control Board. Donovan, who pointed out that he was not minimizing the danger of pollution in the sea, said that there is no identifiable contamination in the northern area, which is the only section used to any extent for recreation. Imperial Valley cities are dumping raw sewage into the New River which flows into the southern end of the sea, but Donovan reported progress is being made to eliminate this unfavorable condition.—*Coachella Valley Sun*

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Bristlecone Pine Area Withdrawn

WHITE MOUNTAINS—The National Forest Service has set aside as a Natural Area 27,000 acres in the White Mountains for the protection of the ancient bristlecone pine forest. Arrangements have been made for the stationing of a ranger in the area to protect the trees, believed to be the oldest living objects on earth. Within the Natural Area boundary are 100 bristlecones over 4000 years old and thousands in the 3000 - 4000 age bracket. The Forest Service plans to open a campsite on the edge of the area.

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Joshua Park Acquisition Near . . .

LANCASTER—Only two privately owned parcels remain to be acquired in the proposed 3000-acre Joshua Tree State Park in Antelope Valley. The total project involved 19 parcels. However, the state reported it has hit a snag in the acquisition program in the form of a Federal mineral reservation encumbering the 320 acres bisecting the site.—*Ledger-Gazette*

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Hot Water Bowl Below Valley . . .

CALIPATRIA — A possible huge underground basin of volcanically-heated water which could provide enough steam power to supply all of Southern California with electricity has been found in Imperial Valley. The basin was tapped at a depth of 4700 feet during oil exploration drilling in the northern Imperial Valley near the Salton Sea.—*Yuma Sun*

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Indian Cemetery Restoration . . .

TWENTYNINE PALMS — The local American Legion Auxiliary has taken on as a community service project the restoration of the Chemehuevi Indian Cemetery just west of the Twentynine Palms Oasis. Among the 60 Indians thought to be buried here is Chief Jim Boniface, known among whites as Old Man Jim. He died in 1903 at the age of 90.—*Desert Trail*

County to Inspect Small Tracts . . .

SAN BERNARDINO—Small tract improvements completed by lessees on Federal Government land in San Bernardino County will be inspected by the county. The cooperative arrangement was made through an agreement between the county and the Bureau of Land Management.

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NEVADA

Jarbidge Wild Area Established . . .

HUMBOLDT FOREST—The National Forest Service has established the Jarbidge Wild Area embracing 66,-107 acres of the Humboldt National Forest. The area includes major portions of the scenic Jarbidge Mountains in northern Elko County. In all, eight mountain peaks varying from 10,100 to 10,839 feet in elevation above sea level are in the new wild area. —*Nevada Appeal*

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Mead Most Popular Park . . .

LAKE MEAD — The Lake Mead National Recreation Area — with its feature attraction of Hoover Dam — is the most visited park area in the nation. During the record year of 1957, a total of 2,955,257 tourists visited the dam and lake.—*Pioche Record*

Pony Express Group Formed . . .

CARSON CITY—Articles of incorporation for the National Pony Express Centennial Association have been filed in Nevada, thus paving the way for the organization of a statewide committee to direct local celebration of the famed mail-carrying system in 1960. Similar papers were filed in Utah, and others are planned for California, Missouri, Wyoming, Kansas, Nebraska and Colorado, for it was through these eight states that the Pony Express operated for 18 months commencing in April, 1860. The National Association will sponsor a re-running of the Pony Express from St. Joseph, Missouri, to Sacramento, California.—*Nevada State Journal*

Land for Gunnery Range . . .

LOVELOCK—The Department of Interior has approved withdrawal of 791,106 acres of public lands in northern Nevada for the controversial Navy aerial gunnery range (*Desert,* Oct. '56). At the same time, the government restored to full public use about 2,000,000 acres of land originally requested by the Navy in 1955 in addition to the acreage it obtained. The lands are in the Black Rock Desert and Sahwave Mountains. The withdrawal is for a five year period, and provides for a five-year extension if need for such is demonstrated. — *Nevada State Journal*

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NEW MEXICO

Bat Rabies Being Studied . . .

LAS CRUCES — Headquarters for a nationwide study of rabies in bats was established at New Mexico A&M College. Directing the five-year program is Dr. Denny G. Constantine of the U. S. Public Health Service. Among the questions Constantine and his associates will try to answer is whether bats can transmit the fatal disease to other wild and domestic animals and to human beings. If bats do transmit the disease, the field station at the college will seek the answer to how, when and where this is done. Next will come the development of methods of control.—*Las Cruces Citizen*

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Navajo Dam Bids Opened . . .

NAVAJO DAM SITE — Bids for construction of Navajo Dam in northern New Mexico were scheduled to be opened on June 19. The Department of Interior, in making this announcement, said it hopes construction contracts can be awarded by June 30. The dam and reservoir project on the San Juan River is a major storage feature of the Upper Colorado River Storage Project. Estimated cost of the Navajo unit is $42,372,000. It is designed to provide storage, river regulation, irrigation water and aid sedimentation control. The irrigation water would serve the proposed $135,000,000 Navajo Irrigation Project.—*Phoenix Gazette*

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Many on Government Payroll . . .

SANTA FE—One out of every five persons in New Mexico derives his income directly from the government, compared with the national average of one in 14. According to official government figures, 27 percent of all personal income in New Mexico comes from government payrolls. Only Virginia, with 29 percent of its wage-earners working for the government, has a higher percentage. — *Grants Beacon*

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Giant Solar Furnace Planned . . .

ALAMOGORDO — Construction is scheduled on a massive mountain-top solar furnace whose purpose it will be to determine what intense heat does to materials which may go into space ships. The $10,000,000 furnace is designed to concentrate the sun's rays with a simple but giant-size system of optical mirrors. Based on calculations, the furnace should be able to concentrate temperatures up to 8000 degrees Fahrenheit in a tiny circle five inches in diameter. This temperature is 70 percent as hot as the sun.—*Antelope Valley Ledger-Gazette*

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UTAH

Loco Weed Kills Livestock . . .

VERNAL—Uintah Basin sheep and cattle raisers have experienced serious livestock losses this past winter as a result of loco weed on the winter range. Members of the Uintah Wool Growers Association lost between 3000 and 4000 ewes since January from the poison weed. Botanists have uncovered three different species of loco weed in the area between Bonanza and Willow Creek. Normally, loco weed is not palatable, but once animals start eating it, a desire and habit is developed.—*Salt Lake Tribune*

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Signs to Keep Drivers Alert . . .

WENDOVER—The long and monotonous 102-mile stretch of highway between Wendover and Grantsville which crosses the barren Great Salt Lake Desert, will be dotted with 14 new signs designed to prevent motorists from dozing at the wheel—a serious highway hazard on this road. "Watch for Sleepy Drivers!" "Keep Alert and Keep Alive!" and "Be Alert, Don't Doze at the Wheel!" are some of the messages that will appear along the western leg of U.S. Highway 40.—*Salt Lake Tribune*

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Indian Petroglyph Returned . . .

MONTICELLO—San Juan County's petroglyph carving of a mastodon was returned to its original location in Indian Creek. The unusual ancient Indian writing was discovered by two Moab men. Later the 700-pound slab of rock bearing the petroglyph was removed to Moab where plans were made to make it a part of an exhibit for a new museum scheduled to be built there. Following protests from Monticello-area residents, the Department of Interior ruled that because the petroglyph was removed without its permission, it had to be returned to its original site.—*San Juan Record*

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"Dutch John" Name Urged . . .

MANILA—William D. Hurst, former Ashley Forest supervisor, believes the Flaming Gorge Dam townsite should be named Dutch John, Utah. The name would do much to preserve the area's colorful history, Hurst said. Dutch John Hanselena was a stock raiser and miner in the Manila area in the 1860s.—*Vernal Express*

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Poor Road to Four Corners . . .

FOUR CORNERS—The governors of Utah, Colorado, Arizona and New Mexico recently announced agreement that a suitable marker should be erected at the place where their states have a common meeting place—but one writer who followed the washboard trail to the site suggests that perhaps improving the road would be the best monument the states could provide. A small monument encircled by stones already exists at Four Corners. The last eight miles to the monument is a narrow rutted path with 35 side trails leading from it—and not one of them is marked.—*Salt Lake Tribune*

MINES and MINING

Victorville, California . . .

A new method of controlling cement dust pollution was installed at the Southwest Portland Cement Company's Victorville plant. Known as the "Bag House" method of control, the revolutionary new system was perfected at a cost of $1,000,000. The cement industry throughout the world, as well as many other industries faced with similar air pollution problems, may benefit from the new control experiment if it proves successful.—*Victor Press*

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Lovelock, Nevada . . .

Owners of mining claims on Federal land in Washoe, Humboldt and Pershing counties that will be released from the U. S. Navy's aerial gunnery range demands, will not have to do assessment work for the fiscal year ending June 30, 1958. The Interior Department's decision thus eliminates what might have been a hectic rush by miners to preserve their titles to valuable mining lands. Last year, when the Navy sought the huge land grab, claim holders complained that if they did their $100 worth of work on each claim and the Navy took over, there would be no repayment. Many held off doing the work because of this uncertainty, others because of the present economic slump in the mining industry. The Navy revised its demands, and is taking only the Sahwave area it used during World War II.—*Lovelock Review-Miner*

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Washington, D. C. . . .

The Atomic Energy Commission has authorized private sale of uranium ores and "yellowcake." Prior to the AEC's decision, the U.S. government had allowed only itself to buy and sell uranium. Industry leaders were quick to note that the privilege of selling uranium to other than the government will give the uranium industry a chance to develop a market while still being supported by the Federal government. The AEC will continue to license all sales, issuing permission upon receipt of "satisfactory information concerning the proposed use of the materials."—*Grants Beacon*

Los Angeles . . .

Utah's first crude oil shipped via the Four Corners Pipe Line arrived in Los Angeles in late April. The pipe line at present is operating at its 70,000-barrel-per-day capacity. About 47,000 barrels daily are coming from the 225 wells in San Juan County, Utah; and 23,000 barrels daily from 500 wells in New Mexico. Experts say Utah's oil production should increase five-fold over last year's, because of the pipe line.

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Garfield, Utah . . .

Sale of the world's largest copper smelter at Garfield by American Smelting and Refining Company to Kennecott Copper Corporation recently took place. Sale price was $20,000,000 cash. The transaction marks the end of over 50 years close association between the two concerns in smelting copper concentrates from the rich Bingham mining district. Kennecott will not take physical possession of the plant and facilities until January 2, 1959. Some 1300 employees at the big Garfield smelter are affected by the announcement.—*Salt Lake Tribune*

Washington, D.C. . . .

No Federal Government license or permit is needed to prospect for, or mine uranium on open public lands, the U.S. Bureau of Land Management announced. All valuable mineral deposits on land belonging to the United States, both surveyed and unsurveyed, are open to prospecting and location unless the land is classified for specific use.—*Grants Beacon*

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Hesperia, California . . .

Duke City Enterprises of Hesperia has begun placer gold mining operations on 480 acres of land in the Summit Mining District. Known for over a century, the diggings once were worked with small hand tools by Mormon emigrants.—*Victor Press*

Cordova, New Mexico . . .

Proposed construction of a $250,000 mill for the processing of mica and associated minerals near Cordova, was announced by officials of two firms, Mineral Industrial Commodities of America, a Dallas company; and Clute Corporation, Denver. The mill is expected to have a 300-ton-per-day ore capacity. Completion date was set for early fall. Reserves on the companies' holdings have been estimated at a minimum of 500,000 tons of scrap mica, in addition to other tonnages of columbite, titanium and beryl.—*New Mexican*

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Blythe, California . . .

Woolstone, Inc., Palo Verde Valley's newest industry, successfully completed trial runs at its new plant about six miles north of Blythe on the Midland Road. The company has perfected methods of converting wollastonite into spun fiber for domestic insulation materials. The new plant represents an investment of $300,000, and when in operation will employ a maximum of 70 men. It has a capacity of 50 tons daily.—*Palo Verde Valley Times*

Tonopah, Nevada . . .

Gold and silver bullion ingots valued at $7273 were poured at the Silver Peak Mill of the United States Mining and Minerals Corporation. Company officials said the procedure is expected to be repeated at 10-day intervals. Enough silver and gold ore was stockpiled to supply the 400-ton treatment plant for several months, but custom ore was invited from all sources within practical hauling distance. — *Pioche Record*

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Four Corners Area . . .

With new oil and gas exploration in prospect for Navajo Tribal lands in the Four Corners Area, the regional demand for barite is bound to be good for some time to come, mining experts predict. Nearly 85 percent of the barite used in this country goes into drilling mud for the oil industry. Nevada has already stepped up its output from 44,000 tons to 114,000 tons, and barite mining activity also is increasing in Arizona and New Mexico. Over 75 percent of the nation's domestic barite comes from Arkansas and Missouri.—*Pioche Record*

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Garfield, Utah . . .

Construction is underway on a $200,000 fluorine chemicals facility at Garfield. Building the plant is United Heckathorn, Inc., of Richmond, California. The company also plans to set up an agricultural chemicals plant at Salt Lake City. Most immediate objective in sales and production will be output of artificial cryolite, a complex fluorine salt (sodium aluminate fluoride) which is used as a flux or catalyst in the aluminum industry. United Heckathorn hopes to produce between 1600 and 1800 tons of the material in Utah this year.—*Salt Lake Tribune*

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San Juan County, Utah . . .

Latest technological advances in uranium mining methods by the country's largest independent operation, Continental Materials, Inc., were described by the Bureau of Mines. Continental's No. 1 mine in San Juan County, where 12 men are employed, produces 1500 tons of vanadium-bearing uranium ore a month. Continental's advanced mining techniques include blending ore from two different ore bodies to keep the grade of shipments at a profitable level; diesel-powered trackless mining and haulage units in the underground operations; new roof support methods; different types of drills and explosives for varying rock formations; and analysis of mine air to guard against radioactive gases.—*Battle Mountain Scout*

GEMS AND MINERALS

July-August Gem Shows

July 4-6—Bend, Oregon. Second Annual Central Oregon Gem and Mineral Show, presented by the Deschutes Geology Club at the Bend Armory. Held in conjunction with the Mirror Pond Pageant.

July 19-20—Watsonville, California. Third Annual Show of the Pajaro Valley Rockhounds at the Fairgrounds.

July 19-20—Paradise, California. Mineral Club's show at Paradise Memorial Hall.

July 26-27—Fallon, Nevada. Third Annual All Nevada Gem and Mineral Show at the Fairgrounds. Lahontan Gem and Mineral Club, host. Also participating are the Pyramid and Washoe societies of Reno. Camping facilities available for visitors. Field trips planned.

July 26-27—Crescent City, California. Del Norte Rockhounds Show at Fairground pavilion.

July 26-27 — DeLake, Oregon. Sixteenth Annual North Lincoln Agate Society's show at DeLake grade school.

August 2-3—Anderson, California. Second Annual Rock Swap of the Shasta Gem and Mineral Society. Event will be held at the Coleman Fish Hatchery, 11 miles east of Anderson. Camping, fishing and swimming available to visitors.

August 7-9 — Asheville, North Carolina. Eastern Federation of Mineralogical Societies Annual Convention and Show. Southern Appalachian Mineral Society, host.

August 10 — Hollister, California. Tri-County Clubs Annual Rock Swap at Bolado Park. Sponsored by Hollister, Monterey Bay, Santa Cruz and Pajaro Valley societies.

August 14-17 — Placerville, California. El Dorado County Gem and Mineral Society's show in conjunction with county fair.

August 16-17—Morton, Washington. Rockologist Club's Second Annual Jubilee Gem and Mineral Show.

August 16-17 — Santa Cruz, California. Mineral and Gem Society's show at Riverside Hotel.

August 30-September 1—Pasco, Washington. Eighteenth Annual Northwest Federation Show and Convention at high school gymnasium. Lakeside Gem and Mineral Club of Kennewick, host. Camping for visitors along Columbia River will be available.

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Members of the Southern California Mineral Identification Society of Los Angeles named the following new officers: Fred Lowe, president; Ted Arnold, vice president; Herbert A. Joslin, historian; and Gladys Joslin, secretary-treasurer.

INYO AREA GEM FIELDS MAPPED BY ASSOCIATION

The Southern Inyo Planning Association plans to mail a gem and mineral location map to all Western rockhound societies. The map covers an area from Red Rock Canyon, California, on the south, to Coledale, Nevada, on the north, and extends from the Alabama Hills on the west to Beatty, Nevada, on the east. It shows 11 gem and mineral areas.

Available at the Association's Lone Pine office will be free mimeographed detail maps of each of the areas.—*Inyo Independent*

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INSECTS IN AMBER GIVE CLUES TO ANCIENT WEATHER

Insects which crawled over the earth 30,000,000 years ago, perfectly preserved in bits of amber, are being studied by scientists at the University of California. Paleontology Professor J. Wyatt Durham said the insects probably caught in the tree resin millions of years ago, with the resin eventually becoming amber. The specimens were collected in Mexico two years ago. So far the scientists have identified about 75 species of prehistoric insects. The insects give vital clues to the type of climate and vegetation which existed 30,000,000 years ago. — *S.M.S. Matrix*

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The first paint pigment to be made chemically was Egyptian Blue — manufactured 1000 years before King Solomon built his temple and 3000 years before the birth of Christ. Although the secret for its production was lost about 700 A.D., the pigment has been analyzed and found to contain sand mixed with lime, soda and copper carbonate. The ingredients were heated for several days at between 1450 and 1650 degrees Fahrenheit.—*S.M.S. Matrix*

SOUTHERN CALIFORNIA MINE CLOSED TO COLLECTORS

Ralph Potter, owner of the Himalaya Mine at Mesa Grande, California, announced that this property is no longer open to collecting by amateur rockhounds. The mine produced many tons of tourmaline in the early 1900s and for the past several years Potter has been extending many tunnels. Recently a tourmaline strike was reported, and the owner feels that the increase in visitors may hamper mining operations.—Compton, California, Gem and Mineral Club's *Rockhounds Call*

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New officers of the St. Louis Mineral and Gem Society are: Karl Busch, president; Charles Seger, vice president; Mrs. Mabel Toeniskoetter, secretary; Arthur Matlack, treasurer; Mrs. Gloria Chastonay, historian; and Kenneth Gibbons, Howard York, Charles Ozment and Mrs. Shirley Jean Courtney, directors.—*Rock Lore*

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These new officers were elected by the Pomona Valley, California, Mineral Club: Sterling Pugsley, president; Orrin Hillburg, vice president; Mrs. Helen Welch, secretary; Mrs. C. W. Henderson, treasurer; and Dr. John L. Sugar, director.

GEM MART

ADVERTISING RATE
12c a word . . . Minimum $2.00

BOOKS - MAGAZINES

HAVE REAL FUN with desert gems, minerals and rocks. The rockhounds' how-to-do-it magazine tells how. One year (12 issues) only $3.00. Sample 25c. Gems and Minerals, Box 687-D, Mentone, Calif.

THE BOOK of Mineral Photographs, 118 pages, octavo, over one hundred pages of excellent illustrations of fine minerals and rocks with descriptions. Indexed. $1.68 postpaid. B. M. Shaub, 159 Elm Street, Northampton, Massachusetts.

CUT - POLISHED - TUMBLED GEMS

LARGE VARIETY mixed tumbled stone —Tigereye, agates, obsidian, palm root, quartz. 40-60 stones in pound—only $4. Cash or money orders, tax paid. Sid's Originals, Route 1, Box 369, Beaumont, California.

GENUINE TURQUOISE: Natural color, blue and bluish green, cut and polished cabochons — 25 carats (5 to 10 stones according to size) $3.50 including tax, postpaid in U.S.A. Package 50 carats (10 to 20 cabochons) $6.15 including tax, postpaid in U.S.A. Elliott Gem & Mineral Shop, 235 E. Seaside Blvd., Long Beach 2, California.

FACETED STONES, cabochons, carved stones, etc. Drop us a postcard for free price list. R. Berry & Co., 5040 Corby St., Omaha 4, Nebraska.

ATTENTION DEALERS and novelty stores: "Baroque Jewelry" — earrings, necklaces, key chains, lariats, cufflinks and baroques by the pound; also polished thundereggs, petrified wood, snowflake obsidian—ready for resale. Write for wholesale prices now. Roy's Rock Shop, Box 133, Trinidad, California.

MEXICAN AGATE BAROQUES. Very colorful, high polish, $4 pound. Rare eye agate $6 pound postpaid. Send for price list on rough Mexican agate. W. T. Osborne, Box 407, Alamogordo, N.M.

CUTTING MATERIALS

DINOSAUR BONE. Gem quality colorful agatized, jasperized, opalized bone 50c pound. Also beautiful red lace agate $1 pound. Postage extra. Gene Stephen, Route 2, Grand Junction, Colorado.

TURQUOISE—Exceptionally clean American water-worn nuggets in pure undyed natural colors and higrade solids. $5 brings your choice postpaid 150 grams "good" or 125-g. "better" or 100-g. "best." Desertgems, Macatawa, Michigan.

OPALS, DEEP RED, blue, green, golden, flashing in all colors of the rainbow, direct from the mine, 15 for $5.00. 10 ringsize stones (opal, amethyst, etc.) ground and polished, ready to set $5.00. Kendall, Sanmiguel d'Allende, Guanajuato, Mexico.

TURQUOISE FOR SALE. Turquoise in the rough priced at from $5 to $50 a pound. Royal Blue Mines Co., Tonopah, Nevada.

WE ARE MINING every day. Mojave Desert agate, jasper and palm wood shipped mixed 100 pounds $10.50 F.O.B. Barstow. Morton Minerals & Mining, 21423 Highway 66, R.F.D. 1, Barstow, California.

CHALCEDONY ROSES, ropes, fire agate: mixed rough. Up to three inch pieces, $2 pound. Larger pieces, $3 pound. Sample, three pieces, $1. 10% tax. Postpaid. Tako Rock Gems, Box 332, Sierra Vista, Arizona.

OPALS AND SAPPHIRES direct from Australia. Special—this month's best buy: Fine Andamooka cutting opals: 1 ounce green opal, 1 ounce transparent opal, 1 ounce opal chips. All 3 ounces airmailed for $18. Send personal check, international money order, bank draft. Free 16 page list of all Australian Gemstones. Australian Gem Trading Co., 49 Elizabeth Street, Melbourne, Australia.

EQUIPMENT — SUPPLIES

ULTRA VIOLET lamps for spectacular mineral fluorescence from $14.50. Free brochure. Radiant Ultra Violet Products, manufacturer, DM, Cambria Heights 11, New York.

BEFORE YOU BUY any lapidary equipment, send a postcard for our new price lists on all types of lapidary equipment and supplies. See how we can save you freight costs, etc. R. B. Berry & Co., 5040 Corby St., Omaha 4, Nebraska.

6" DISC DRY sanding cloth. 220, 320. 6 for $1. Postpaid. Stop at our yard for supplies. Jewelry. Rocks. Pollard, Rt. 2, El Cajon, California. East on 80.

BOLA AND JEWELRY finding price list. Compare our prices before you buy. Please include 10c to cover cost of mailing. Dealers send resale number for wholesale list. The Hobby Shop, Dept. DM, P.O. Box 753, 1310 Elgin Street, Caldwell, Idaho.

NOTICE ROCKHOUNDS! — Hand-forged one piece polished steel prospecting picks, $4 each postpaid in U.S.A. Ray Flarty, Box 160, Nederland, Colorado.

DEALERS

VISIT GOLD PAN Rock Shop. Beautiful sphere material, gems, mineral specimens, choice crystals, gem materials, jewelry, baroques, etc. Over 100 tons of material to select from. John and Etta James, proprietors, 2020 N. Carson Street, Carson City, Nevada.

DESERT ROCKS, woods, jewelry. Residence rear of shop. Rockhounds welcome. Mile west on U.S. 66. McShan's Gem Shop and Desert Museum. P.O. Box 22, Needles, California.

ROCKS—opposite West End Air Base, agate, woods, minerals, books, local information. No mail orders please. Ironwood Rock Shop, Highway 60-70 west of Blythe, California.

MINERALS - FOSSILS

12 POUNDS OF beautiful Colorado mineral specimens, $8.00 prepaid. Ask for list of others. Jack the Rockhound, P. O. Box 245, Carbondale, Colorado.

GREEN GARNETS from Mexico. While they last, a full pound of green garnet crystal specimens from Mexico for $3 pp. R. Berry, 5040 Corby St., Omaha 4, Nebraska.

FOSSILS. 12 different for $2. Other prices on request. Will buy, sell or trade. Museum of Fossils, Clifford H. Earl, P. O. Box 188, Sedona, Arizona.

GEMMY FLUORITE octahedrons. 3 pairs $1. Each pair a different color. Gene Curtiss, 911 Pine St., Benton, Kentucky.

GOLD QUARTZ specimens for sale. Extremely rich gold quartz from a producing Mother Lode mine. These specimens have been hand picked for their excellence as collectors' items. $2 and up postpaid. Also fine quality gold nuggets $2 and up. Dell Riebe, P.O. Box 46, Grass Valley, California.

MISCELLANEOUS

35-YEAR COLLECTION of rocks, petrified palm, iron and other woods, agates, fire agates and cabinet specimens. D. W. Rogers, three blocks north of Midland Elevator, Ashton, Idaho.

TIGEREYE, CROCIDOLITE ARE NOT SAME THING

A common mistake made by mineral collectors is to use the words "tigereye" and "crocidolite" synonymously.

Crocidolite is a blue asbestiform mineral, a variety of monoclinic amphibole. It is neither rare nor abundant, occurring here and there in Europe, South America and New England (Massachusetts and Rhode Island) in small quantities. The fibers usually are long, very slender and easily separable. They feel more or less like the fibers of amosite or harsh forms of chrysotile.

African tigereye is a highly silicified crocidolite in which the fibers have been changed to iron oxide. The prevailing color of the resulting chatoyant material is a rich golden brown. Red and shades of blue also are known. Throughout the 19th Century tigereye was used extensively in jewelry. Carved into cameos, intaglios and cuvettes it most often was seen in men's rings, set in heavy plain or carved mountings.—Mineralogical Society of Arizona's *Rockhound Record*

TUBE DRILL IS PRACTICAL WAY TO BORE GEM STONES

Very often in the making of jewelry, it is necessary to drill a hole in a stone. Dangle earrings and bracelets, certain types of pendants, keyring stones, etc., are more attractive if drilled and suspended from a silver wire cemented in the hole. Caps will work too, but often they detract from the natural beauty and symmetry of the stone. Beads, of course, must have holes in their centers.

A practical method for an amateur to drill stones is by using a hollow tube drill powered by a small drill press capable of operating at high speeds. Actually, drilling is a modified form of sawing and to obtain the customary 3000 surface feet per minute speed of a saw, the drill should revolve about 150,000 times per minute! Actually, the best speed most amateurs can get is about one-eighth of this.

The drill should be mounted vertically, and the table should be supported on an adjustable spring so that it can be raised and lowered rapidly.

To prepare the stone, dop it securely in the middle of a small ring. This ring should extend about a quarter-inch above the stone. Clamp, screw or dop the plate to the drill press table and fill the cup created by the ring with coarse silicon carbide grit. Moisten the grit with glycerine and add a few drops of water.

Start the grinder and immediately depress the table to take the tube out of contact with the stone, then let it up again as quickly as possible. Continue to work the table up and down as fast as practicable. Be sure the grit mixture flows freely under the tube at every stroke. Stop occasionally to stir the grit in from the outside of the cup, and if the tube stops cutting add more grit.

It will take between 10 and 15 minutes to cut through a quarter-inch of agate. Of course diamond dust and oil will work much faster than the silicon carbide, but it is rather expensive.—Wm. Aulsenbrook in the Evansville Lapidary Society's *News Letter*

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The seven-year job of grinding and polishing the 20-ton glass disc used in making the 200-inch telescope mirror for the Mt. Palomar Observatory required 62,000 pounds of abrasives. Five and a quarter tons of glass were removed in the process. —*Pseudomorph*

PRESERVE SILVER, COPPER SPECIMENS WITH LACQUER

Lacquering silver and copper specimens after cleaning will keep them bright for a long time. Most copper cleaned with cyanide will have a rosy hue for a day or so after cleaning, but on exposure to air will return to its original color. Therefore it is best to wait a day or two after cleaning before lacquering the copper.

Metallic lacquer should be used for it is very clear. It should be applied as a solution of one part lacquer to three parts thinner. An atomizer or spray is the best method to apply the lacquer. Specimens can be dipped in the solution and then placed on an unpainted wood surface and turned occasionally to drain and dry, which takes only a few minutes. A second coat is advisable if examination with a magnifying glass reveals that the surface is not entirely covered.

Dipping realgar and orpiment specimens in the lacquer solution prevents these specimens from crumbling, and the red and orange colors will be retained. Two coats of lacquer are recommended. Very thin lacquer should be used on these specimens to avoid a "painted" look.—Mary P. Allen in the Arrowhead Mineralogical Society's *Arrow Points*

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CRYSTAL IDENTITY DIFFICULT

Classically-formed crystals are the exception, not the rule, for most crystals are distorted in one or more ways. Most common form of distortion is over-development of one set of faces at the expense of another set, producing flattened or elongated crystals. This often leads to the erroneous description, for example, of octahedrons (magnetite, spinel, diamond, etc.) as tabular crystals.

When four faces of an octahedron are overdeveloped at the expense of the other four, the result appears, on quick examination, to be an orthorhombic form typical of barite or celestite.

A common distortion often found in rutile, tourmaline, stibnite and many other minerals is the acicular form. This is where crystals appear like hair or needles. It is caused by growth in only one direction after the initial small crystal has been formed.

The one thing to remember is that no matter how badly a crystal is distorted, the angle between two faces remains the same as in the ideal form, except in certain special cases. Badly distorted crystals may often be identified by careful measurement of these angles.

The causes of these distortions are many. Often it is obvious, as when the crystal comes in contact with adjacent crystals, other rocks, etc. In these cases, however, the crystals generally do not show crystal faces on the affected parts.—George Smith in the Oklahoma Mineral and Gem Society's *Sooner Rockologist*

DEFECTIVE GEM SLABS ENHANCE HOME AQUARIUM

Defective gem stone slabs often present such an unusual aspect that the lapidary places them in storage, rather than discarding them. Then when a visitor comes to the house, the stone is taken down, wet with a sponge to bring out its startling pattern, and then returned to the closet.

The home aquarium may be the ideal place to permanently display such stones.

Mary Blair of the Montebello, California, Mineral and Lapidary Society covered the bottom of her aquarium with polished clear smoky Apache tears. Under water the tears appear as opaque black velvet or sparkling smoky jewels, depending on the angle from which they are viewed.

Next step was to line the back wall of the aquarium with slices of translucent Oregon agate showing massive white plumes. Bits of delicate aquarium greenery placed between the slices of plume concealed the visible portions of the glass wall.

On the Apache tear floor, she placed hollow geodes and bits of colorful agate. In the foreground march a line of "unusual characters" — chalcedony roses twisted in bizarre shapes.

When the fish were returned and the aquarium's lights turned on, Mary Blair had a vivid and startling display which appeared to be half fact and half fancy.—*The Braggin' Rock*

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MANY BENEFITS COME TO HOBBYIST WHO EXHIBITS

Why should hobbyists display collections at shows and exhibits? Aware of the beauty in Nature, they seem impelled to share this with others—to help others appreciate, understand and enjoy Nature as they find it.

Listed below are the important reasons for exhibiting as suggested by the Mineralogical Society of Southern California:

1. To attract new members. Many now very adept collectors and lapidaries first became interested in gems and minerals by viewing a display at a show, or seeing a private collection.

2. To instruct. During the course of a show, opportunities present themselves not only for the newer members, but for exhibitors as well, to learn more about specimens. A good exhibit is invaluable to a beginner for it shows what the more advanced collectors have and therefore serves as a guide, especially to quality collecting. Often a beginner's sense of discernibility is enhanced by studying advanced collections.

3. For the pleasure involved. Exhibiting can be a great deal of fun.

4. Pride of ownership. It is only natural for collectors to take pleasure from recognition and awards in open competition.

5. Development of friendships. From a common interest in gems and minerals has come many lasting and valuable friendships.—*M.S.S.C. Bulletin*

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Talc, the base for face powder, has been used in experimental phases of the Michigan State University food service laboratory on a new potato-peeling process. High pressure steam containing either talc or rice hulls is forced onto the vegetable, removing only the thin outer layer of the potato.—*S.M.S. Matrix*

FLUORITE, TOO SOFT FOR GEMS, GOOD FOR DISPLAY

Fluorite is a favorite with mineral collectors because of its attractive color range. In crystal or massive form it is found in colorless, white, black, brown, rose, green, blue and violet. Its occurrence is widespread throughout the world.

In composition fluorite has almost equal parts of calcium and fluoride, and under ultraviolet light may fluoresce a soft blue shade. Its luster is glassy and runs from transparent to translucent. A soft stone, fluorite has a hardness of only four on Mohs' scale and therefore is not suitable for jewelry.

When heated, fluorite loses weight and its color fades. Pink and green shades, when heated over 212 degrees F., become highly phosphorescent and glow in the dark. — Iola Roberts in the Slover Gem and Mineral Society's *The Rolling Stone*

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MRS. VIVIENNE DOSSE WINS BITTNER TROPHY

Mrs. Vivienne Dosse of Fontana, California, won the Bittner Trophy for her thumbnail mineral exhibit at the Texas-American Federation Gem Show at Dallas. This was the trophy's first presentation. Nancy Marshall of Palo Alto was awarded the Bittner Trophy for junior division exhibits.

George Ashley won a Special Trophy for his gem bowls, and a second Special Trophy was given to Mrs. Bertha Merrill for her display of minerals from Germany.

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THUNDEREGG DESIGNS MADE IN LABORATORY

Some scientists believe that mineral reagents, including salts of iron and manganese, and various silicates, found their way into mineral jell imprisoned in cavities of old rocks, to form the figures now found in thunderegg agates.

These moss-like designs can be duplicated in the laboratory by dropping crystals of colored salt into a diluted solution of waterglass. Nature apparently dropped its various crystals into mineral jell.—Phil F. Brogan in *The Oregonian*

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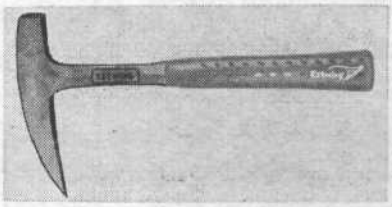
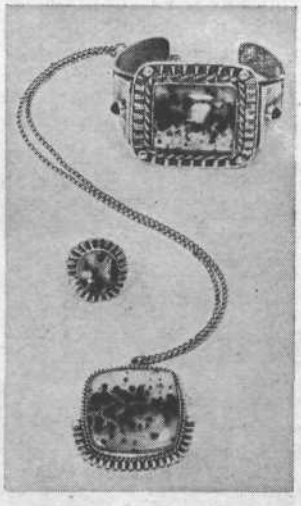
Mark your rock hammer and chisels with bright paint so they can more easily be seen if mislayed in the field. Bright colors contrast with soil and grass.—*Stone Tablet*





AMATEUR GEM CUTTER

By Dr. H. C. DAKE, Editor of The Mineralogist

We have often called attention to the fact that overall brilliance or "life" in any facet cut gem material is governed and limited directly by inherent optical properties—notably its index of refraction.

Without going into a discussion of optical properties, attention may be called to the following facts, long known to experienced facet cutters, when dealing with gem materials having a low index of refraction. Let us take quartz, topaz, and beryl as typical examples in this class.

The facet cutter has three main choices with this material: (1) crown and pavilion angles may be selected to give the finished gem a "live" and sparkling table, but the remainder of the crown facets will be "dead"; (2) crown and pavilion angles may be selected to bring out life and brilliance in the crown facets, but the table will appear dead, especially when the gem is viewed directly from above. In this style of cut, the table will have what is often termed a "well"—something like looking down into a dark well; (3) Crown and pavilion angles may be selected which are in between the above, a compromise we may say, where the table will not appear as a well, nor will the crown facets appear as good as in the first style cut. The compromise style cut is the usual standard selected for commercial stones in this class.

The gem cutter will find various angles given for these gem materials by different writers. All of them may be regarded as correct for obvious reasons as stated here. This may be easily proven by any gem cutter, and it serves as a most interesting experiment, especially when large size gems are cut (over 10 carats each) using the three gem materials referred to here, and cutting one stone in each class for a total of nine all approximately the same size brilliant style cuts.

Some years ago a number of amateur facet cutters carried out experiments along this line. The results were most startling when all the stones were lined up for close comparison. One of the cutters took several of the stones (all colorless) to a number of jewelers for "identification." The identifications made by the innocent jewelers proved most illuminating, and, of course, were wholly different and even included "colorless sapphire."

What is said here does not necessarily apply to colored gems. For example, when dealing with well-colored amethyst, beryl or topaz, disregard angles and refractive index, and cut for best color alone. Amethyst often is found with the best color in certain areas, or a good single color "patch." In these cases the gem is so oriented the best color will appear down low in the pavilion, and not up high in the crown portion. In short, colored gems may be treated in a wholly different manner.

In the case of gem materials having a much higher index of refraction, the requirements are not so close, for here, even though incorrect angles and proportions may be selected, we will still have a presentable finished gem. This would not be possible in dealing with materials in the lower index class. For example, a diamond may be cut to give the greatest diameter "spread." This will make the stone appear larger than if cut to standard commercial proportions and angles. The "spread" or "fish eye' diamond, as it is termed in the trade, will have a thickness, measured from the table top to the apex of the pavilion, less than that of the standard brilliant cut. To the experienced eye, stones in this class are instantly noted, but to the lay eye they get by because they still show a reasonable amount of brilliance and fire, enough to satisfy the lay customer and still give him a "big" stone.

No matter how much paper work in mathematics the gem cutter may do, the problem still resolves itself into the three main choices referred to here.

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Scarabs made of hard clay or steatite with a vitreous glaze probably were the first seals used by man. The kings of the fourth dynasty 5000 years ago used scarabs carved of softer minerals. The Greeks, much later, cut scarabs from the harder gem minerals, often using carnelian agate.

The engraving seen on scarabs usually is of archaic work, representing a mythological event of some kind. Early Assyrian scarabs were cut in hard stone, rock crystal, green jasper, carnelian and other hard semi-precious gem minerals. The Egyptians often engraved upon the gold bezels of rings, but the art usually is rather crude. The scarabs are of further interest to mineral collectors in that they offer proof that minerals played an important and useful role in the lives of the ancient peoples.

* * *

Gem quality tourmaline free of all flaws and suitable for facet cutting is by no means common material, and generally can not be had at a low price. Tourmaline very often occurs in good quality so far as color is concerned, but all too often the crystal is found shot full of flaws.

Materials unsuited for facet cutting frequently can be cut cabochon with good effect. Small bicolored crystals, where the colors meet in such a position as to permit finishing a cabochon showing equal portions of color, are especially attractive. Ordinary flaws in the material do not detract from the appearance of the finished stone so long as the tourmaline is of reasonably good color.

Some types of green tourmaline exhibit a fibrous structure, and this material even when flawed will frequently yield choice cabochon stones which present a cat's-eye effect. In addition to the various styles of cabochon stones which can be cut from flawed tourmaline, the rough angular fragments often can be worked into presentable material by merely smoothing and polishing. These angular polished fragments can be drilled and used in necklaces and other types of mountings.

* * *

The present popularity of the tumbling barrel for polishing rough gem masses is not at all a new idea in the lapidary field. In some 100-year-old works on lapidary technique we read of similar equipment.

These early tumblers had been in use for centuries. They were called rumblers or shaking machines, but all of them were cylindrical in shape, almost exactly like those in wide use today. In most cases the cylinder was revolved in a normal manner, hand operated by a winch handle or pulley. But in some cases it was operated endways, hence the term shaking machine. Some abrasive, usually fine sand or fine emery, was fed in with the work. Emery, an impure corundum found in Nature, was one of the chief abrasives used in the lapidary industry for many centuries prior to the introduction of modern silicon carbide, first produced some 60 years ago.

An early description of the rumble machine reads as follows, taken from an old work printed in London in 1850: "This is a contrivance sometimes used for polishing small articles, like rough gems, principally by their attrition against each other. The rumble is a cylindrical vessel with a side door for the introduction of the work and the abrasive, and is generally made to revolve as a churn by a winch handle or pulley."

In its industrial uses the rumble barrel also found use in polishing lead shot, cleaning rust from cannon balls, polishing bone buttons with Trent sand, etc.

Seemingly the lapidary industry had forgotten the utility of this contrivance for many decades, until its recent revival.

By RANDALL HENDERSON

THIS IS WRITTEN early in June, and the Smoke Tree branches are carrying great plumes of purple blossoms. When the Smoke Tree blooms we know that summer is here—and to those of us who have spent many summers on this land of high temperatures that is no great hardship, despite the contrary notion which prevails among tenderfeet.

Summer is the time when the native plants and shrubs of this desert land become more or less dormant. The annuals dry up and blow away, after having taken the precaution to produce and broadcast a crop of seeds for next year's flowering, and the perennials conserve their moisture for survival in a period when rainfall is very uncertain.

We humans are intruders in this arid land, and the grace with which we accept the rigors of drouth and heat, depends, like the perennial shrubs and trees, very largely on the inner resources we have at our command. Active minds and busy hands seldom find the heat oppressive. But it helps to drink plenty of water—and that is the one big advantage which human beings have over other forms of life on the desert. If we use our God-given intelligence we need never suffer from lack of water. And that is important, for nine times out of ten that "tired feeling" which is so common a complaint in summer time is due to dehydration. Remember this, that your thirst is never an accurate gauge of the water needed to maintain your body. Drink plenty of water!

* * *

Recently, George F. Miller, Boy Scout executive of Phoenix, told the Rotary club: "Boys need the solitude of the wilderness to help them cope with the hysteria and fear which prevails so widely in our complex society of today . . . they need wholesome adventure and if it isn't provided in a healthful environment they will seek it to no good end elsewhere."

And as every youth leader knows, there is no more wholesome environment than the woods, the canyons and desert and mountain terrain of the virgin areas in our country.

That is an added reason why you and I, and all parents and adults who would like to contribute to the welfare of our own and future generations of children should give what support we can to the Wilderness Bill now pending in Congress (S. 1176 and H.R. 500).

This measure is designed to preserve certain areas of our national park and national forest lands in their primeval condition, where the natural balance of plant and wildlife will be maintained undisturbed by commercial exploitation. These lands would remain accessible to the public for purposes of recreational, scenic, scientific and educational use—but would be preserved as areas where the rights of the natural world would have precedence over the privileges of human beings.

There isn't much virgin wilderness left in the United States and if any of it is to be saved for the benefit of ourselves and future generations of Americans we should lose no time in protecting it.

Dr. J. H. Rush in his recent book *The Dawn of Life* commented on the critical problem that confronts civilized man: "When man obliterates the wilderness he repudiates the evolutionary process that put him on this planet. In a deeply terrifying sense, man is on his own."

* * *

Everett Ruess, young poet-artist of the desert wilderness, once wrote in a letter to a friend: "It is not that I am unable to enjoy companionship or unable to adapt myself to other people . . . but I have found it easier and more adventurous to face situations alone. There is a splendid freedom in solitude, and after all, it is for solitude that I go to the mountains and desert, not for companionship. In solitude I can bare my soul to the mountains unabashed. I can work or think, act or recline at my whim, and nothing stands between me and the wild. Then on occasion, I am grateful for what unusual and fine personalities I may encounter by chance, but I have learned not to look too avidly for them."

* * *

Recently a scientist was quoted in the newspapers: "By 1968 man will be able to regulate the world's weather."

I hope he is wrong. Human beings are not ready for that yet. The suggestion brings to mind some terrifying questions: Who is to control the weather? And for whose benefit? If the Russians do not like Americans, are they to have the power to scourge our land with drouth? Or drown us like rats? Or vice versa? Weather control as a weapon of warfare could become more catastrophic than hydrogen bombs, or even biological warfare.

Human beings have not yet climbed far enough up the ladder of evolution to be given so much power.

I am all for science—for the scientists are the great truth-seekers of this earth. But too much emphasis has been given to the physical sciences. Our greatest need at this stage of evolution is a better understanding of human nature—the humanities. It is more important just now that we learn how to control human hatred, selfishness, intolerance and vanity than that we learn to control the weather.

BOOKS of the SOUTHWEST

MILLER WRITES GEOLOGICAL HISTORY OF CALIFORNIA

California is a geological wonderland. The state contains excellent examples of most of the world's major types of physical features. The high and low deserts, Death Valley, the Sierra Nevadas, Yosemite, the Great Central Valley and California's scenic coast line are only a few of the state's outstanding natural features.

Now available to the reader is William J. Miller's *California Through the Ages—The Geological Story of a Great State*. Essentially a primer on elementary geology, the amateur will find in this volume an accurate guide certain to enhance vacation trips and weekend outings.

Dr. Miller is the author of several textbooks on geology, and before his retirement taught this subject at several major universities. He is a native of California.

In this text, the emphasis is on the succession of geological events—geological history — as recorded in the rocks.

Published by Westernlore Press; 108 illustrations and maps; index; 264 pages; $6.50.

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ABOUT THOSE WHO LIVE IN THE LAND OF THE SAGE

Nell Murbarger writes about people who seldom are in the newspaper headlines. As a roving reporter of the desert, her beat is the remote frontier of the Intermountain West and her subjects are mining men and prospectors, courageous women, ranchers, homesteaders, scientists, traders, engineers and buckeroos.

It is to these people, their problems, their philosophies of life, their work and their avocations that Miss Murbarger has devoted her latest book, a delightful volume with the title *Sovereigns of the Sage*.

Each of the 50 chapters is a complete story in itself — stories that sparkle with human interest and humor. There are the Mantles, Charlie and Evelyn, whose home for 32 years has been a cabin in a remote valley along the Yampa River in Utah; Ed. Smith, the Nevada prospector who spent most of his life mining gold so that he might endow a home for crippled children; the Mormon boys who stole the cannon at old Fort Douglas to prove they were not as stupid as the soldiers accused them of being; the mystery man of California's Mullet Island in Salton Sea.

Much of this material appears in print for the first time, the author having traveled over 150,000 miles in the last dozen years to interview the old-timers she writes about, often making long journeys over unimproved and uncharted trails to reach a miner's remote shack. To check the accuracy of dates and names she delved into old newspaper files and such records as are available at libraries and county seats.

Miss Murbarger's previous book, *Ghosts of the Glory Trail,* devoted mostly to the ghost towns of the Great Basin region, is now in its third printing, and it is safe to predict that the new volume, devoted largely to characters still living, will have a wider distribution even than the former book.

This is a western book unique in many respects, spontaneous and refreshing. It is about life in a land where many city dwellers imagine they would like to live—and yet never have the opportunity to do so.

Published by Desert Magazine Press, Palm Desert, 384 pages, 70 halftone pictures, 8 pages of maps, index. $6.00.

Books reviewed on this page are available at Desert Crafts Shop Palm Desert, California
Add four percent sales tax on orders to be sent to California
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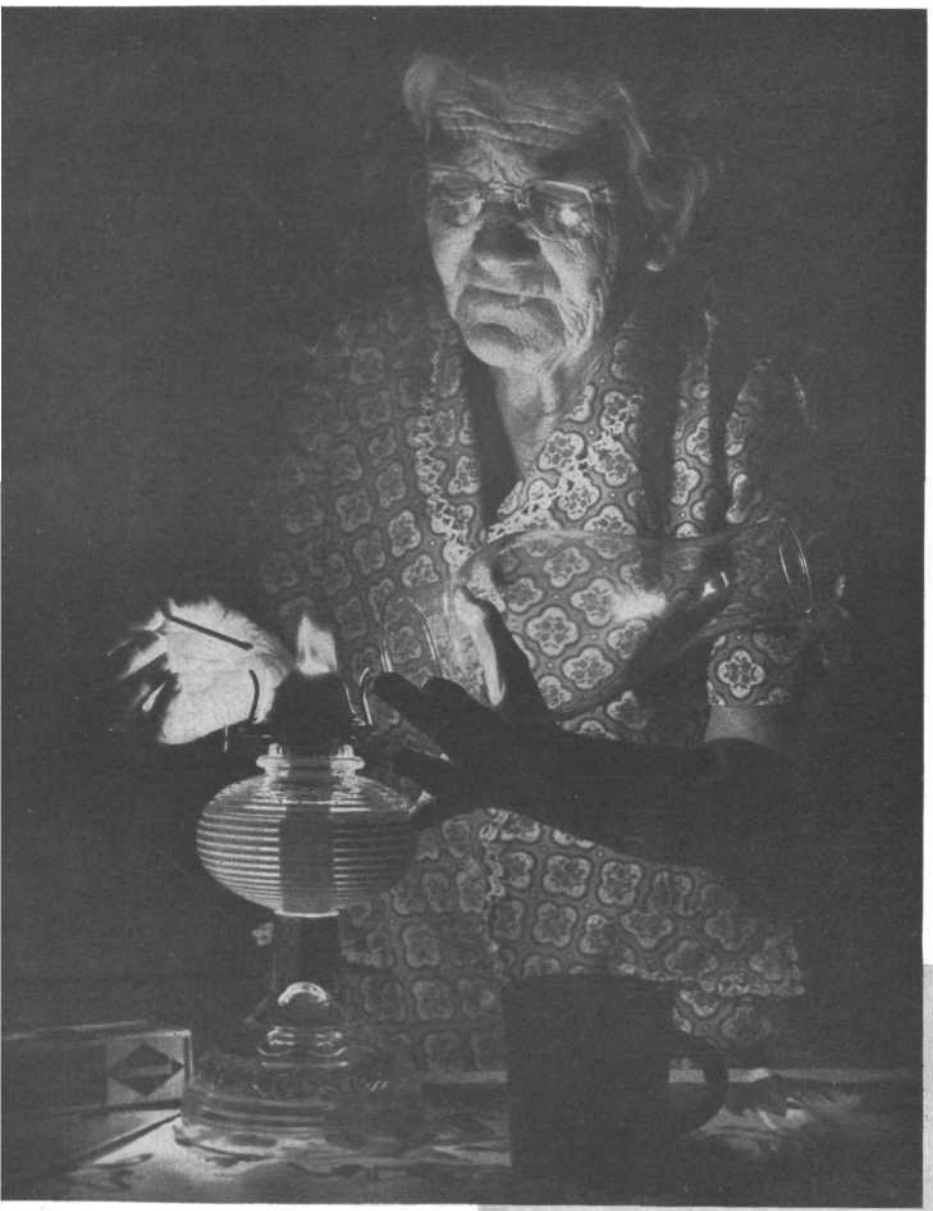
DESERT BEST SELLER LIST*

1. *Sovereigns of the Sage* Nell Murbarger $6.00
2. *Ghosts of the Glory Trail* Nell Murbarger $5.75
3. *Salton Sea Story* Helen Burns $1.00
4. *On the Trail of Pegleg Smith's Lost Gold* J. Wilson McKenney $1.50
5. *Desert Wild Flowers* Edmund C. Jaeger $5.00

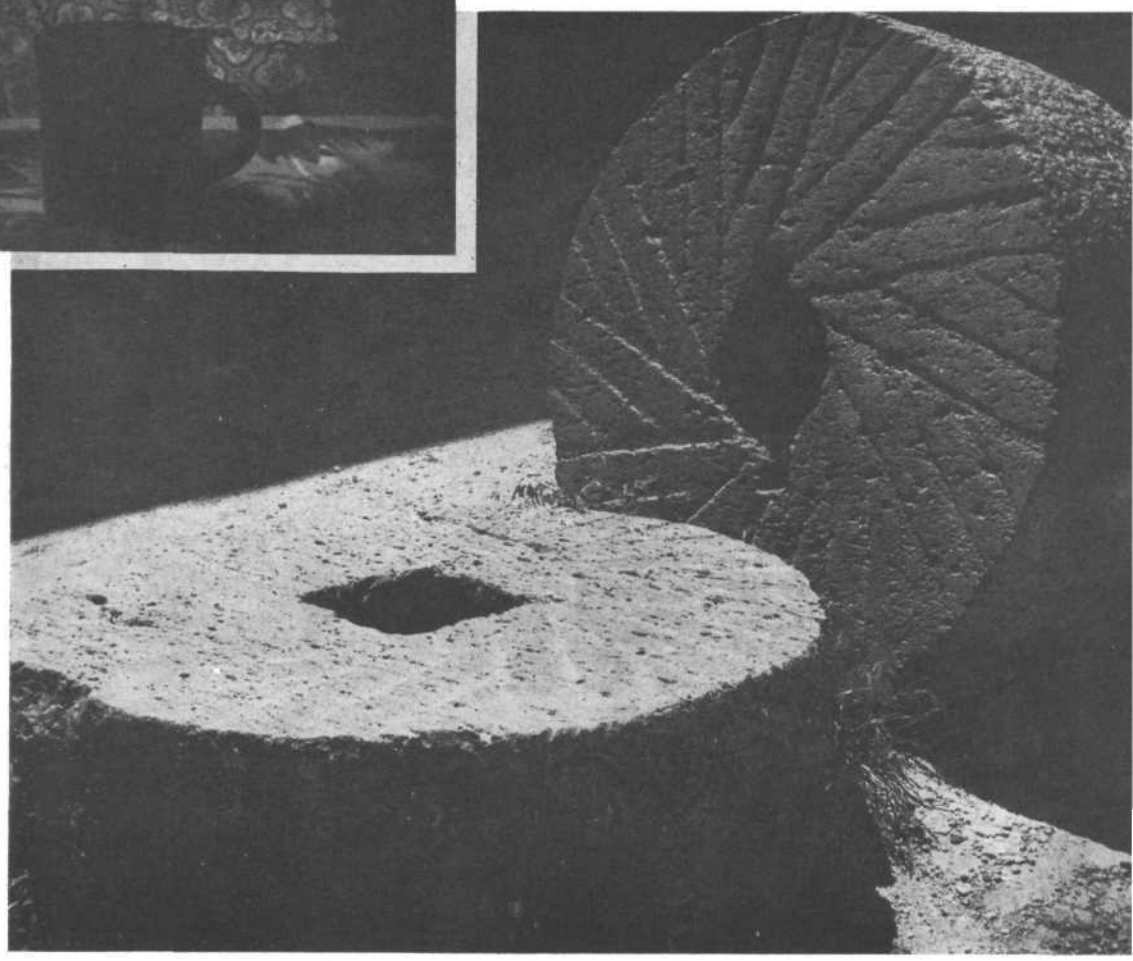
*Based on May sales by Desert Magazine Bookshop



Grandmother . . .

"This is my grandmother, Mrs. Minnie Cook who is 73 years old and has lived in the Southwest all her life. When I showed her this photograph she said 'well, it's a pretty good picture of the lamp!'" That is the story behind this month's winning photograph by L. D. Schooler of Blythe, California. Camera data: 2¼x3¼ Graphic; 1/25 sec. at f. 22; panatomic X sheet film. Schooler used an M-2 flashbulb behind the lamp for this unusual lighting effect.

Pictures of the Month



Millstones

Gene Helland of Cedar City, Utah, was awarded second prize this month for this photograph of two massive millstones. Helland took this picture with a camera setting of 1/50 second at f. 22.